ANTECEDENTS TO JOB CRAFTING AND SELF-UNDERMINING BEHAVIOUR: IMPLICATIONS FOR PERSON–JOB FIT AND JOB PERFORMANCE

by

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ABSTRACT

The manner in which employees approach their work and carry out their particular job tasks can have serious implications for both their wellbeing and performance at work, and, in turn, affect the overall functioning of the organisations for which they work. Moreover, the types of behaviours that employees engage in may be a function of who they are as individuals, that is, their unique personality traits. In the current study, an investigation was undertaken to explore two specific employee behaviours that have shown to differentially affect important work outcomes such as job performance, namely job crafting and self-undermining behaviour. Job crafting is a self-initiated type of employee behaviour that involves employees proactively shaping their job, whereby they may change both the physical and cognitive boundaries of the job. Self-undermining, on the other hand, is a type of maladaptive employee behaviour (e.g., purposefully working slow, creating conflict with colleagues) that creates obstacles for the individuals at work and which subsequently hinders their job performance. To date, there has been limited research that has investigated the individual antecedents and outcomes of these two particular employee behaviours, especially in the South African working context. Furthermore, the instruments (i.e. scales) used to measure these behaviours have predominantly been applied in European (e.g., Netherlands) and Western (e.g., USA) parts of the world, leaving important questions unanswered regarding the psychometric soundness of these instruments in the South African work context. Accordingly, the overarching aim of the current research was to explore individual personality as an antecedent to job crafting and self-undermining behaviour, and the subsequent effects on important workplace outcomes, such as job performance, person–job fit and basic needs satisfaction.

The overarching aim is achieved through three closely-linked, yet independent, research articles. In the first study (Article 1), a Rasch analysis was performed to investigate the psychometric properties of the Job Crafting Scale, the Job Crafting Questionnaire, and the Self-Undermining Scale, which are commonly-used measures of job-crafting and self-undermining behaviours respectively. Aspects such as item fit, reliability, category functioning, and differential item functioning (DIF) were explored to provide greater insight into the psychometric properties of these instruments, which, to date, have not yet been reported. In the second study (Article 2), structural equation modelling was conducted to explore the indirect effect that individual personality has on job performance through job crafting and self-undermining behaviour. In particular, the study looked at (1) how the Five-Factor Model

(FFM) of personality predicts job crafting behaviour, an, in turn, job performance (i.e. in-role behaviour, organisational citizenship behaviour), and (2) how the Dark Triad (DT) of personality predicts self-undermining behaviour, and, in turn, job performance (i.e. counterproductive work behaviour). In the third and final study (Article 3), a weekly diary study was performed to investigate the influence of job crafting on employees' basic needs satisfaction, and, in turn, their person–job fit. Multilevel mediation analysis was employed to investigate the research hypotheses.

Results from the first study showed that the scales used to measure job crafting and self-undermining are both valid and reliable instruments in the South African work context. Worthy of noting is that the Rasch analysis highlighted a few potentially problematic items that appeared to show misfit or DIF for age or gender, and it is recommended that caution be exercised when using these items in future research. In the second article, results derived from structural equation modelling showed that individual personality is indeed a predictor of job crafting and self-undermining behaviour, and, in turn, job performance. In particular, (1) the FFM was found to positively relate to in-role behaviour and organisational citizenship behaviour, through job crafting as a mediator; and (2) the DT was found to positively relate to counterproductive work behaviour, through self-undermining as a mediator. The results from the second study suggest that the personality of individuals may affect the behaviours they engage in at work, which, in turn, may affect important work outcomes such as job performance. Finally, multilevel results from the weekly diary study (Article 3) showed that employees can use weekly job crafting activities to satisfy their basic psychological needs and improve their person–job fit on a weekly-basis. More specifically, results showed that employees who engage in weekly task crafting, relational crafting, and cognitive crafting behaviour can satisfy their weekly need for competence, autonomy, and relatedness, and the satisfaction of these three needs may, in turn, improve employees' weekly fit to the job. The limitations and recommendations for future research are discussed.

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CHAPTER 1: INTRODUCTION AND ORIENTATION TO THE STUDY

1.1 INTRODUCTION

The study of human behaviour in the workplace has occupied the minds of industrial- and organisational (I/O) psychologists for more than a century. With a key focus on improving the design and quality of work, I/O psychologists are particularly interested in understanding the behaviours employees engage in and the subsequent effects these have on important employee and organisational outcomes, such as wellbeing and job performance (Riggio, 2013). In today's fast-paced, technology-driven, and highly competitive world of work, organisations are becoming more reliant on the expertise and insights gained by behavioural specialists (such as I/O psychologists), in order to improve employee wellbeing and the overall effectiveness and positioning of the organisation within the global market space. Having an increased understanding of the behaviours that promote or demote the wellbeing of employees, as well as those that contribute to or jeopardise the success of the organisation, has thus become of paramount concern in today's global economy, where organisations are continuously striving to maintain their competitive edge.

In this study, an investigation was undertaken to explore the individual antecedents and outcomes of two specific employee behaviours that have recently gained interest in organisational behaviour literature, namely job crafting and self-undermining behaviour. In particular, the study looks at how the personality structure of individuals influences their job-crafting and self-undermining behaviour, and how these behaviours, in turn, impact important individual outcomes, including job performance, person–job fit, and basic needs satisfaction.

As a construct, *job crafting* refers to "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (Wrzesniewski & Dutton, 2001, p. 179). It is a proactive, self-initiated form of employee behaviour that involves the employee (i.e. 'job crafter') shaping certain aspects of the job to create a better fit and an improved overall work experience (Niessen, Weseler, & Kostova, 2016). When crafting a job, employees physically alter the tasks they perform (i.e. task crafting), the interpersonal relationships they are involved in at work (i.e. relational crafting), and the manner in which they perceive their job (i.e. cognitive crafting) (Wrzesniewski & Dutton, 2001). Considered a 'new' and 'exciting' area for research by major proponents in the field (e.g., Oldham & Hackman, 2010), the past decade

has witnessed a steady increase in job crafting research across a range of occupations, including public services (Bakker, 2015), police work (Petrou, Demerouti, & Schaufeli, 2016a), teaching (Leana, Applebaum, & Schevchuk, 2009; Peral & Geldenhuys, 2016), healthcare (Gordon, Demerouti, Le Blanc, & Bipp, 2015) and travel (Cheng, Chen, Teng, & Yen, 2016).

Relevant to today's changing nature of work (see World Bank Group World Development Report 2019), research has demonstrated that employees can use job crafting behaviour to adapt and cope in changing organisational contexts (Ghitulescu, 2012; Petrou et al., 2016a; Petrou, Demerouti, & Xanthopoulou, 2016b). Several lines of evidence also suggest that job crafting is positively related to aspects such as work engagement (Demerouti, Bakker, & Gevers, 2015; De Beer, Tims, & Bakker, 2016; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012; Tims, Bakker, & Derks, 2013), person–job fit (Niessen, Weseler, & Kostova, 2016; Tims & Bakker, 2010; Tims, Derks, & Bakker, 2016), organisational commitment (Cheng et al., 2016; Ghitulescu, 2006), job satisfaction (Berg, Wrzesniewski, & Dutton, 2010; Eguchi et al., 2016; Tims, Bakker, & Derks, 2012), and job performance (Demerouti, Bakker, & Halbesleben, 2015; Tims, Bakker, Derks, & Van Reenen, 2013), to name a few. While some employees may benefit from proactive behaviours such as job crafting, others may tend to engage in more destructive forms of employee behaviour, like behavioural self-undermining.

Self-undermining denotes a consistent pattern of undesirable workplace behaviours that employees engage in, which create obstacles for them and subsequently hinder their job performance (Bakker & Costa, 2014; Bakker & Wang, in press). Similar to but different from the concept of *self-handicapping* (Berglas & Jones, 1978), the term *self-undermining* is reserved for specific workplace behaviours that negatively impact job performance, while self-handicapping, on the other hand, can occur in various other life domains apart from the working context (e.g., academia, sport). Examples of self-undermining behaviour include creating conflict with co-workers, making mistakes, procrastinating, purposefully working slow, and creating unnecessary stress and confusion amongst colleagues (Bakker, 2015). In contrast to job crafting, research on self-undermining behaviour is still in its infancy, and relatively little is known about the construct. Preliminary evidence does, however, suggest that individuals who engage in self-undermining experience an increase in job demands and, over time, increased levels of burnout (Bakker, 2015; Bakker & Costa, 2014; Bakker & Wang, in press).

1.1.1 Problem Statement

Despite the rapid growth in research on job crafting, and, conversely, the dearth of research on self-undermining, it is still unclear what motivates or drives individuals to engage in these two forms of workplace behaviour. To date, there has been limited research, particularly within the South African work context, that has focused on the individual antecedents of job crafting and self-undermining behaviour respectively. Little, if any, research exists that investigated the precursors of self-undermining behaviour, and the antecedents of job crafting are still not well understood (Bakker, Tims, & Derks, 2012; Lyons, 2008; Niessen et al., 2016), and previous studies have called for future research to expand upon the individual factors or conditions that encourage job crafting behaviour (e.g., Vogt et al., 2016; Wrzesniewski & Dutton, 2001).

Job crafting and self-undermining are both related to the well-being and performance of employees (Bakker & Costa, 2014; Bakker, 2015; Tims, Bakker, & Derks, 2013), making it imperative to understand the drivers that cause employees to engage in these particular behaviours and the subsequent effects these have on important workplace outcomes. To this end, the overarching aim of the current research was to investigate the individual antecedents and outcomes of job crafting and self-undermining behaviour within the South African working context. This overarching aim was achieved through three closely linked, yet independent, research articles, which are briefly outlined below.

1.1.2 Overview of Articles

Prior to any concrete conclusions being made about the individual antecedents and outcomes of job crafting and self-undermining behaviour, it is essential to first understand how these two behaviours are measured and understood within the multicultural context of South Africa. Until now, research on job crafting and self-undermining has been conducted predominantly in Western and European contexts (Bakker, 2015; Bakker & Costa, 2014; Eguchi et al., 2016; Laurence, 2010), which has left important questions unanswered regarding the pervasiveness of job crafting and self-undermining in various other cultural contexts (Slemp & Vella-Brodrick, 2014; Tims et al., 2012), like South Africa. In the first study, reviewed in **Article 1**, a Rasch validation was performed on three organisational behaviour measures that are commonly used to measure job crafting and self-undermining behaviour, namely the Job Crafting Scale (Tims et al., 2012), the Job Crafting Questionnaire (Slemp & Vella-Brodrick,

2013) and the Self-undermining Scale (Bakker & Wang, in press). The purpose of the study was to conduct a thorough investigation of the psychometric properties of the instruments commonly used to measure job crafting and self-undermining, and to determine whether the construct validity of these two behaviours holds true for South African working individuals. Aspects such as unidimensionality, item fit, rating scale functionality, scale reliability, and differential item functioning (DIF) were explored.

Hackman, Lawler, and Porter (1977) argue that possessing the knowledge of the nature of individuals, such as their personality, is the basis of understanding and predicting their behaviour in organisations. Indeed, meta-analytic findings have shown that the personality structure of individuals predicts important workplace outcomes such as job satisfaction, motivation, leadership, and team performance (see Bell, 2007; Ones, Viswesvaran, & Dilchert, 2005). Understanding the personality of employees may even help predict acts of workplace deviance, such as aggression and bullying behaviour (see Baughman, Dearing, Giammarco, & Vernon, 2012; Mitsopoulou & Giovazolias, 2015). While there is substantial evidence of the predictive validity of personality regarding various workplace outcomes, the impact that personality has on job crafting and self-undermining behaviour has received far less research attention.

Against this background, the second study, reviewed in **Article 2**, looks at individual personality as an antecedent to job crafting and self-undermining behaviour, and the subsequent effects on individual job performance. Using structural equation modelling, the study looks at how the Big Five personality traits predict job crafting behaviour and, in turn, an individual's task and contextual performance. In addition, the study investigated how the Dark Triad of personality predict behavioural self-undermining, and, in turn, counterproductive work behaviour. The research models for the second article are depicted in Figures 1a and 1b, below.

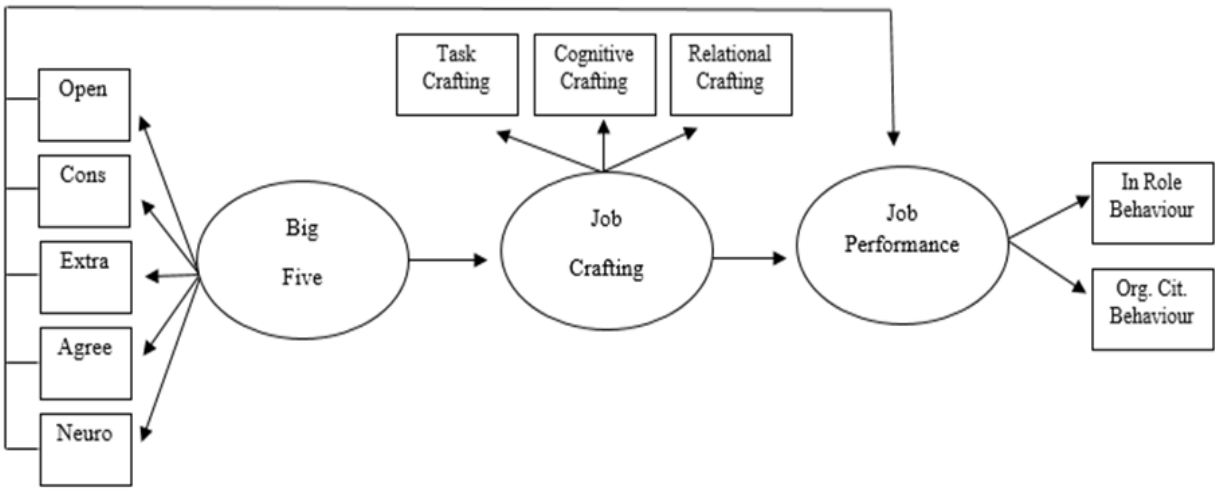

Figure 1a. The Big Five Personality traits, job crafting, and job performance

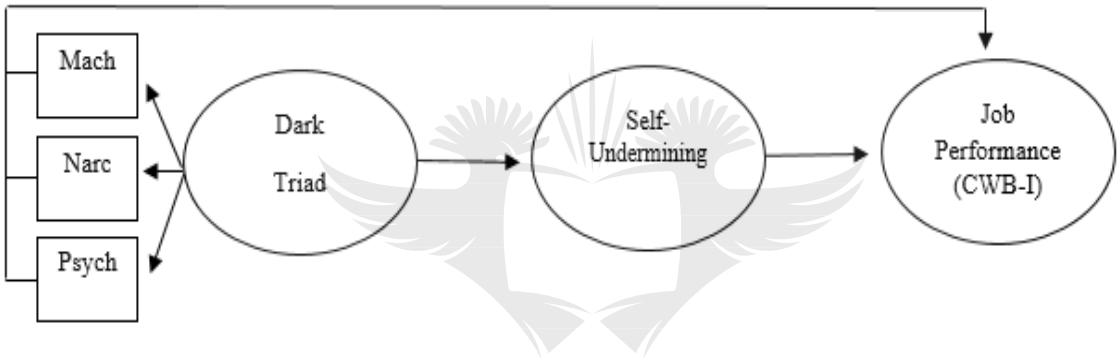

Figure 1b. The Dark Triad, self-undermining, and job performance

Although Wrzesniewski and Dutton (2001) originally proposed that job crafting is a behaviour that manifests regularly, and not once-off, researchers have recently begun to demonstrate the dynamic and fluctuating nature of job crafting behaviour (Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012; Tims, Bakker, & Derks, 2014; Tims, Derks, & Bakker, 2016), with findings generally pointing to job crafting as a proactive behaviour that occurs on a weekly and even daily basis. Accordingly, the third and final study, reviewed in **Article 3**, employed a weekly diary design to capture and monitor individuals' weekly job crafting behaviour over a period of four weeks. Diary studies are a useful tool to investigate social, psychological, and physiological processes as they unfold over daily and/or weekly situations, and can be effectively used to capture temporal dynamics within and between individuals in the workplace (Bolger, Davis, & Rafaeli, 2003; Ohly, Sonnentag, Niessen, & Zapf, 2010).

Drawing inspiration from self-determination theory (Ryan & Deci, 2001), the goal of the third study was to investigate the indirect impact that weekly job crafting behaviour has on weekly person–job fit (P-J fit) through weekly basic needs satisfaction. Previous researchers have proclaimed that employees can use job crafting as a means to satisfy their basic psychological needs of autonomy, competence, and relatedness (Bakker & Van Woerkom, 2017; Slemp & Vella-Brodrick, 2014; Tims, Derks, & Bakker, 2016; Wrzesniewski & Dutton, 2001), yet little empirical research exists to support these claims. Similarly, while job crafting is consistently said to improve the fit between the individual and the job (e.g., Bakker, 2015; Wrzesniewski & Dutton, 2001), there is scant research that actually tested this relationship (*cf.* Tims, Derks, & Bakker, 2016). The proposed research model for the third article is depicted in Figure 2, below.

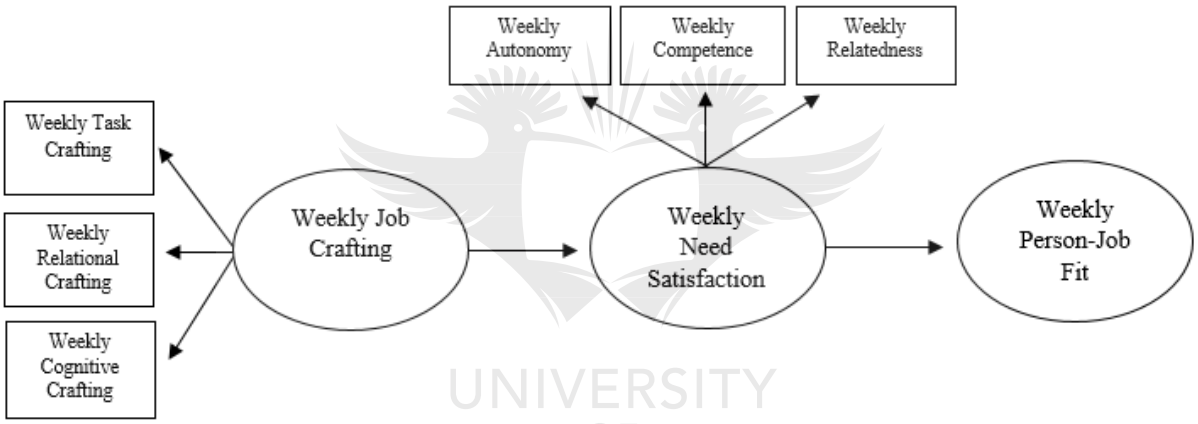

Figure 2. Hypothesised research model for Article 3

The remainder of the chapter is structured as follows. First, a brief literature review of the study variables is provided, to orientate the reader with regard to the various constructs of interest. The constructs are briefly defined, and relevant research pertaining to each construct is provided. This is followed by an explanation of the methodology employed, in which the respondents, research design, measuring instruments, and statistical analyses for each of the three articles are discussed. The chapter concludes with the ethical considerations that were adhered to in the current research.

1.2 LITERATURE OVERVIEW OF THE STUDY VARIABLES

1.2.1 Introduction

The following sections provides a broad overview of the literature and research pertaining to the study constructs and their interrelationships. A more comprehensive literature review is provided in each article, in which the various constructs and their hypothesised relationships are explicated and elaborated upon. The purpose of the following section is merely to provide some background information on the research constructs, in order to orientate and equip the reader with relevant baseline knowledge, in preparation for the reporting of the three studies that follow.

1.2.2 Job Demands–Resources Model

Job crafting, which entails the manipulation of work characteristics, is a form of workplace behaviour that is best explained by the Job Demands–Resources (JD-R) Model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Bakker and Demerouti (2014) argue that employees may adapt their job demands and job resources through job crafting behaviour. The JD-R Model is based upon the premise that working conditions can be grouped into two broad categories, namely job demands and job resources. Job demands are those aspects (i.e. physical, social, and organisational) of the job that require prolonged physical or mental effort and resultantly carry certain physiological and psychological costs (Demerouti et al., 2001). Examples of job demands include role conflict, increased workload, and time pressures. Given that job demands require prolonged physiological and psychological effort, they have the potential to exhaust the mental and physical resources of employees, which may lead to health-related issues such as burnout and stress (Ghitulescu, 2012). In addition to its negative impact on employee health, job demands have shown to negatively impact the energy levels in organisations (Owens, Baker, Sumpter, & Cameron, 2016). Furthermore, Demerouti, Bakker, and Gevers (2015) found that job demands are negatively related to work engagement.

Job resources, on the other hand, are those aspects (i.e. physical, psychological, social, and organisational) of the job that are functional in achieving work-related goals; these help reduce the stressors associated with job demands, and serve as a means for personal growth and development (Bakker & Demerouti, 2007; Demerouti et al., 2001). Examples of job resources include autonomy, performance feedback, and social support. Job resources are not only necessary to effectively deal with job demands, but, in line with conservation of resources (COR) theory (Hobfoll, 1989), they are also important for the accumulation and protection of additional resources (Bakker & Demerouti, 2007). Job resources have found to be positively

related to important employee-related outcomes such as work engagement and job performance (Breevaart, Bakker, Demerouti, & Van den Heuvel, 2015). According to Bakker and Demerouti (2014), employees who have ample job resources are better equipped to deal with their daily job demands.

As a framework, the JD-R Model is particularly appealing to work with, as it may be applied across various occupations, and may also serve as a tool to improve employee well-being and performance (Bakker & Demerouti, 2007). Indeed, research on job crafting has shown that changes in work characteristics, namely increasing job resources and changing job demands, positively impact employee well-being (Tims, Bakker, & Derks, 2013). Recently, Van Wingerden, Bakker, and Derks (2016) conducted a study on the effectiveness of a JD-R intervention amongst healthcare professionals, and found in the post-test assessment (approximately four weeks later) that it had significantly increased employees' levels of psychological capital, work engagement, job performance, and job crafting behaviour.

1.2.3 Job Crafting

Wrzesniewski and Dutton (2001) first introduced job crafting as "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (p. 179). Over the years, however, job crafting as a concept has gained considerable research attention, and as such, has taken on various conceptualisations. For example, Tims and Bakker (2010) refer to job crafting as the strategies that employees use to shape their work characteristics. Similarly, Slemp and Vella-Brodrick (2013) describe job crafting as an informal process whereby employees shape their work practices to create a better alignment with their idiosyncratic interests, such as their personality and personal values. Emphasising its proactive nature, Berg, Dutton, and Wrzesniewski (2007) define job crafting as the process by which employees take the opportunity to customise their jobs by proactively altering the tasks they perform and the social interactions in which they are involved at work, while Weseler and Niessen (2016) refer to it as "a self-serving kind of proactivity that consists of different behaviours and cognitions that differently relate to performance outcomes" (p. 683).

Inherent to these definitions, although not explicitly stated, is the fact that job crafting is a self-initiated form of workplace behaviour that is undertaken by the employee. As such, it is regarded as a bottom-up approach to job design (Bakker, Tims, & Derks, 2012; Berg, Dutton, & Wrzesniewski, 2013), whereby employees, themselves, without the direct intervention of

management, take the initiative to change aspects of their work, in order to bring about positive work experiences. According to Tims, Bakker, and Derks (2013), many positive individual and organisational outcomes may arise as a consequence of job crafting. For one, individuals may gain a renewed sense of meaning in their work and experience an improved work identity (Wrzesniewski & Dutton, 2001). Vogt et al. (2016), in a recent three-wave study, also found that job crafting successfully predicted psychological capital and work engagement over time. Furthermore, Cheng et al. (2016) found that job crafting related positively to job satisfaction, organisational commitment, and job performance.

Job crafting in South Africa

Often referred to as the 'rainbow nation', South Africa is a country well-known for its rich ethnic and multi-cultural diversity. In comparison to The Netherlands who have one official language (i.e., Dutch) and considered to be a feministic society, South Africa is home to a staggering 11 official languages, four main ethnic groups (i.e., Black African [80.2%], White [8.4%], Mixed-Race [8.8%], Indian/Asian [2.5%]), and considered to be a predominantly masculine society (Hofstede Insights, 2018; CIA, 2018). Despite its potential and wide-spread offerings, job crafting research within South Africa remains in its infancy. Consistent with international findings however, the few research studies that have been conducted in South Africa have yielded promising findings. For example, De Beer et al. (2016) found that job crafting predicted job satisfaction amongst a sample of miners and manufacturers. Peral and Geldenhuys (2016), in a study amongst high school teachers, found that job crafting was positively related to psychological meaningfulness and work engagement. Lastly, Bell and Njoli (2016) showed that employees' personality traits have important implications for job crafting behaviour.

1.2.3.1 A self-determination theory perspective of job crafting

Wrzesniewski and Dutton (2001) developed a model of job crafting that highlights the individual motivations that spark this form of workplace activity, that is, the factors that motivate or drive people to craft their jobs. They argue that an individual's motivation for job crafting arises from three individual needs: the need for control over the job, the need for a positive self-image, and the need for human connection with others (Wrzesniewski & Dutton, 2001). These needs are well positioned within Ryan and Deci's (2000) self-determination theory (SDT). According to SDT (Ryan & Deci, 2000), human beings strive to fulfil three

basic psychological needs, namely the need for autonomy (i.e. control over the job), the need for competence (i.e. a positive self-image), and the need for relatedness (i.e. human connection with others). *Autonomy* denotes making your own decisions or exercising discretion in how tasks are performed; *competence* implies finding something that you are good at, and feeling a sense of mastery in the process of doing it; and *relatedness* entails establishing satisfying and meaningful social ties or relationships with others (Funder, 2010). Funder (2010) points out that one cannot become a fully functioning person without the attainment of these three psychological needs. Furthermore, Ryan and Deci (2000) state that, when these three psychological needs are met, individuals' self-motivation and overall well-being may be enhanced.

In line with previous claims (Bakker & Van Woerkom, 2017; Slemp & Vella-Brodrick, 2014; Tims, Derks, & Bakker, 2016; Wrzesniewski & Dutton, 2001), the present study, Article 3 in particular, contends that job crafting may provide individuals with the opportunity to satisfy these three basic psychological needs. First, job crafting allows individuals to redesign or modify their jobs to better suit their own preferences, knowledge, and skills, consequently providing them with a sense of control or autonomy over the job. Second, through the process of job crafting, individuals may develop the skills and capabilities that are required to effectively shape their work characteristics, which may result in them experiencing a renewed work identity (i.e. positive self-image) and a sense of competence. Thirdly, job crafting enables individuals to build social relationships with their colleagues at work, which may satisfy their need for relatedness (Wrzesniewski & Dutton, 2001).

1.2.3.2 Forms of job crafting behaviour

It is worth taking note of the various forms of job crafting behaviour that employees may engage in to proactively alter their work characteristics and to bring about positive change. Based on Wrzesniewski and Dutton's (2001) original conceptualisation of job crafting, employees can craft their job in the following three ways: First, employees can change the task boundaries of their job, which involves physically changing the form, scope, or number of tasks or activities that one is involved in while doing the job (called *task crafting*). Second, employees may change the cognitive boundaries of their job, which entails the reconceptualization of the job (e.g., seeing the job as an integrated whole, as opposed to distinct and separate tasks), which is referred to as *cognitive crafting*. Third, employees may change

the relational boundaries of their job, which involves exercising discretion over whom they interact with while performing their job and determining the quantity and quality of relationships with others at work (called *relational crafting*).

Adopting a more theoretical approach to explaining job crafting behaviour, Tims et al. (2012) grounded job crafting within the framework of the JD-R Model and propose three conceptually distinct dimensions of job-crafting behaviour. These are: increasing job resources (i.e. autonomy, performance feedback, and social support), increasing challenging job demands (i.e. taking on more tasks and engaging in volunteer work), and decreasing hindering job demands (i.e. role conflict and role ambiguity) (Tims et al., 2012). Taking a similar approach, Petrou and colleagues (2012) conceptualise job crafting in terms of three distinct proactive behaviours, namely seeking resources, seeking challenges and reducing demands. Seeking job resources, which includes behaviours such as seeking advice from supervisors, requesting performance feedback, and actively searching for learning opportunities (Petrou et al., 2012), could help employees to complete tasks and achieve work/organisational goals, as well as help them cope with various job demands (Demerouti et al., 2015). Seeking challenges, on the other hand, includes behaviours such as seeking more responsibility or taking on an additional workload (Demerouti et al., 2015; Petrou et al., 2012). Lastly, reducing demands (e.g., workload and time pressure) refers to behaviours that are directed towards reducing the emotionally, physically, and mentally taxing aspects of the job (Petrou et al., 2012).

Adding to these various forms of job crafting behaviour, Laurence (2010) proposes two other forms of job crafting, namely expansion and contraction-oriented job crafting. Expansion-oriented job crafting, as the name implies, involves expanding the task and relational environment of one's job, while contraction-oriented job crafting involves making the job smaller or less complex. Laurence (2010) points out that contraction-oriented job crafting does not imply the reduction of work effort or the desire to do less; rather, it is the reframing of a job so that it better fits the individual's needs or meanings. Regardless of the various forms of job-crafting behaviour proposed above, what is important is that job crafting is a psychological, social, and physical act (Wrzesniewski & Dutton, 2001).

Job crafting literature suggests that, regardless of organisational context, there will always be opportunities in the workplace for individuals to engage in job crafting behaviours (Berg, Dutton, & Wrzesniewski, 2008; Leana et al., 2009; Petrou et al., 2012; Slemp & Vella-

Brodrick, 2013; Wrzesniewski & Dutton, 2001). Wrzesniewski and Dutton (2001) state that, "even in the most restricted and routine jobs, employees can exert some influence on what is the essence of the work" (p. 179). The present study, however, argues that job crafting as a proactive, self-starting form of behaviour is not suited to all types of individuals. Although having the potential to manifest across a broad range of diverse working contexts, it is believed that an individual's personality may predict the extent to which he or she engages in job crafting, as well as the type of job crafting that he or she performs. According to Carlos and Rodrigues (2016), differences in individuals' personality result in variability in their level of skills, knowledge, work habits, and traits. Given that job crafting can form part of an individual's work habits, it is plausible to argue that individuals will vary in their job crafting propensities, due to the different personality traits that drive their actions.

1.2.4 Self-undermining

Whereas job crafting is a proactive form of workplace behaviour that leads to positive individual and organisational outcomes, self-undermining is a destructive form of workplace behaviour that is associated with negative outcomes (Bakker, 2015; Bakker & Wang, in press). Although, as a concept, self-undermining is still relatively under-developed and has received minimal research attention, it is worth taking note of this deviant and peculiar employee behaviour, as it could be detrimental to the well-being and performance of both the employee and the organisation. Indeed, Bakker and Wang (in press) carried out two independent studies in China, and found that behavioural self-undermining is negatively related to job performance, through burnout. That is, burnout is a product of self-undermining behaviour, which subsequently leads to decreased levels of job performance. In the same study, it was found that self-underminers are inclined to be less proactive, display fewer job crafting behaviours, and are less engaged in their work.

Self-undermining is similar to, yet different, from the more popular notion of 'self-handicapping,' which denotes a self-protective strategy that individuals use in anticipation of failure, whereby they seek or create obstacles that may hinder their performance (Berglas & Jones, 1978). Self-handicapping is regarded as self-protective, in that it preserves the individual's self-esteem in the event of failure. Thus, upon failure, an individual will blame the self-handicap (obstacle), rather than his or her own ability. Self-undermining, on the other hand, is not a strategy to protect one's self-esteem in the event of failure per se, but rather a

specific and enduring pattern of undesirable workplace behaviours that undermine job performance (Bakker & Wang, in press). Bakker and Costa (2014) refer to it as a form of behaviour that creates obstacles for the individual, which may undermine his or her performance. Examples of self-undermining include making mistakes, avoiding task accomplishment or interactions with others, and creating conflict with organisational stakeholders (Bakker, 2015).

In the current study, it is argued that individuals' personality influences the extent to which they engage in both job crafting and self-undermining behaviour, and these behaviours, in turn, have an effect on important individual outcomes such as job performance, person–job fit, and basic needs satisfaction. The following section discusses the topic of personality, and introduces two taxonomies of personality, namely the Five-Factor Model and the Dark Triad, which have been used in previous research to predict and explain various workplace behaviours in which employees engage in.

1.2.5 Personality

Personality encompasses an individual's characteristic way of thinking, feeling, and behaving (Costa, 1996; Funder, 2010). It is the systematic description of traits (McCrae & Costa, 1987) that are enduring and distinctive characteristics that describe both an individual's attitude and behaviour (Buss, 1989; Minton & Schneider, 1980). More broadly, personality represents all the various traits that differentiate people from one another (Minton & Schneider, 1980).

There are three primary factors that interact with each other in the workplace: (1) the personality of the employee, (2) the tasks in which the employee is involved, and (3) the environment in which the employee is operating and performing his or her work (Furnham, 2001). Therefore, when studying employee behaviour, one should not only consider the features of the job itself (Oldham & Hackman, 2010), but also the personal characteristics (i.e. personality) of the job incumbent. Indeed, the role that personality plays in understanding employee behaviour has become of importance for applied psychologists (*cf.* Christiansen & Tett, 2013).

A main goal to achieve when conducting basic personality research is the selection and identification of personality variables that are embedded within a widely useful taxonomy (Saucier & Goldberg, 2003). A taxonomy can be viewed as a compilation of phenomena that

have been systematically divided (i.e. broken down) to form a series of ordered groups or categories (Saucier & Goldberg, 2003). Two taxonomies of personality in particular that have strongly appealed to applied psychologists and gained considerable research interest are the Five-Factor Model and the Dark Triad (*cf.* De Fruyt & Salgado, 2003), which are respectively discussed below.

1.2.5.1 The Five-Factor Model

The Five-Factor Model (FFM) of personality is a taxonomy of behavioural tendencies, consisting of affect, cognition, and motives, which allows distinctions to be made among individuals (Tett, 2013). The FFM is built on the premise that there are five personality factors, commonly referred to as the *Big Five*, which, conjunctively, explain the majority of the variance in individual behaviour (Paunonen & Nicol, 2001). The five traits that make up the Big Five are extraversion, agreeableness, conscientiousness, neuroticism, and openness to experiences (McCrae & Costa, 1997).

There are a number of reasons for the popularity of the Big Five personality framework. Some include the fact that the Big Five framework displays impressive stability and agreement over time and across observers. It provides significant coverage of personality dimensions that are considered socially-important, and it has shown impressive predictive validity (Saucier & Goldberg, 2003). While the Big Five framework can be used to predict important work outcomes such as job performance (e.g., Barrick & Mount, 1991), not all traits are equally valid in predicting various work outcomes (*cf.* Furnham, 2008). Some personality traits (i.e. extraversion, agreeableness), for example, are better predictors of sales performance in jobs that require a lot of social interaction (see Barrick & Mount, 1991). Woods and Sofat (2013), in a study consisting of working adults in the UK (n = 238), found that the Big Five relate differently to employees' work engagement levels. Specifically, extraversion (i.e. assertiveness) and conscientiousness (i.e. industriousness) were found to be the strongest predictors of work engagement. The Big Five traits are briefly discussed below.

1.2.5.1.1 Openness to experience

Individuals who score high on *Openness to experience* are regarded as sophisticated, insightful, and have wide interests (McCrae & John, 1992). McCrae (1996) puts forth that these individuals are curious, unconventional, and flexible (McCrae, 1996), while others view them

as creative and imaginative (Funder, 2010). Indeed, research has found openness to be positively related to creativity (e.g., Rothman & Coetzer, 2003), and previous meta-analytic findings confirmed that it is related to the job performance of both individuals and teams (Barrick & Mount, 1991; Bell, 2007).

1.2.5.1.2 Conscientiousness

Conscientiousness as a trait includes attributes such as being planful, persistent, and hardworking, which are all important for accomplishing work tasks across different job types (see Barrick & Mount, 1991). Highly conscientious individuals have a tendency to be well-organised, diligent, achievement-oriented, neat, and thorough (Barrick & Mount, 1991; McCrae & John, 1992). Contrastingly, those with low *Conscientiousness* tend to be careless, disorderly, and somewhat irresponsible. As with *Openness to experience*, research has found *Conscientiousness* to be related to important work outcomes. For example, DeShong, Grant, and Mullins-Sweatt (2015) found that *Conscientiousness* negatively related to counterproductive work behaviour. Echoing these findings, Guay et al. (2016) found that *Conscientiousness* positively related to organisational commitment, and negatively to workplace deviance (counterproductive behaviours), suggesting that conscientious individuals are more committed to the organisation and less likely to engage in deviant workplace behaviours.

1.2.5.1.3 Extraversion

Extraverted individuals are enthusiastic, assertive, and dominant (McCrae & John, 1992). Traits that are frequently associated with *Extraversion* include being social, friendly, fun-loving, affectionate, talkative, and active (Barrick & Mount, 1991; Costa & McCrae, 1987). Furthermore, individuals with high *Extraversion* are outgoing, impulsive, and uninhibited (Minton & Schneider, 1980). According to Roodt (2009), extraversion also relates the comfort levels that an individual feels towards relationships; the higher an individual scores on *Extraversion*, the more comfortable he or she will be in building relationships with others. The polar opposite of extraversion is introversion. In contrast to extraverts, introverts are quiet, socially-retiring, keep to themselves, and are shy and introspective (Minton & Schneider, 1980).

Using the other Big Five traits, previous studies have documented the positive effects of *Extraversion* on job performance. For example, Barrick and Mount (1991), in their meta-

analytic review of the personality–performance relationship, found *Extraversion* to be a significant predictor of overall job performance across occupations that involved social interaction. Furthermore, with specific reference to research on teams, Bell (2007) found that team-level extraversion positively related to team-level performance.

1.2.5.1.4 Agreeableness

Agreeableness is generally associated with positive features such as showing sympathy, kindness, and appreciation. Judge and Ilies (2002) describe agreeable individuals as kind, warm, and gentle, whereas Furnham (2008) posits that agreeable individuals tend to be liked and admired by their co-workers for their empathy, cooperativeness, and trustworthiness. According to Guay et al. (2016), they also tend to be more motivated to get along with others, and, as such, are more likely to form and satisfy positive relationships with their co-workers. Unsurprisingly, in their study amongst South Korean employees, Guay et al. (2016) found *Agreeableness* to negatively relate to interpersonal deviance. Echoing these findings, DeShong et al. (2015) found that agreeable individuals were less likely to engage in counterproductive interpersonal work behaviours.

1.2.5.1.5 Neuroticism

The fifth and final dimension of the Big Five personality traits is *Neuroticism*. Neurotic individuals struggle to adjust emotionally, and often display symptoms such as stress, anxiety, and depression (Judge & Ilies, 2002). Persons with high *Neuroticism* are moody and emotionally overresponsive, while those who are low are more emotionally stable and appear to be calm, relaxed, and even-tempered (McCrae & John, 1992; Minton & Shneider, 1980). According to McCrae and Costa (1987), neuroticism not only encompasses negative affect, but also the disturbed cognitions and behaviours that accompany emotional distress. In their meta-analysis, Judge and Ilies (2002) found *Neuroticism* to be a valid predictor of performance motivation. Specifically, *Neuroticism* was negatively related to performance motivation across the studies included in their meta-analysis. In another study, Kim, Shinn, and Swanger (2009) found *Neuroticism* to be positively related to burnout, and negatively related to vigour (a sub-dimension of work engagement).

1.2.5.2 The Dark Triad

In contrast to the Big Five, three conceptually distinct and socially aversive personality constructs have been proposed as the so-called *Dark Triad*, namely Machiavellianism, narcissism, and psychopathy (Paulhus & Williams, 2002). These dark personality traits are evident in expressions such as 'snakes in suits', 'toxic employees', and 'bad bosses,' and are commonly found in analyses of counterproductive work behaviour (Furnham, Richards, & Paulhus, 2013; O'Boyle, Forsyth, Banks, & McDaniel, 2012). Some of the shared features between these three traits include behavioural tendencies such as self-promotion, emotional coldness, and aggressiveness (Paulhus & Williamson, 2002). They also share a common core feature of callous manipulation (Furnham et al., 2013).

Specifically, the *Psychopathy* trait can be characterised by high impulsivity and thrill-seeking behaviour, along with low empathy and anxiety (Paulhus & Williams, 2002). Psychopaths tend to disregard social norms, which often results in them engaging in antisocial behaviours (O'Boyle et al., 2012). *Machiavellianism*, in its simplest sense, refers to a manipulative type of personality (Paulhus & Williams, 2002). Individuals who score high on this trait are cynical, utilise social manipulation to achieve success, and are largely unprincipled (Furnham et al., 2013). Machiavellians' lack of concern for the rights of others lead them to behave in a manipulative manner (O'Boyle et al., 2012). Jakobwitz and Egan (2006) state that Machiavellians use interpersonal strategies that are marked by deceitfulness and self-interest, and they are more likely to exploit others. With regard to *Narcissism*, such individuals often show signs of aggression and hostility, especially when their egos are threatened (O'Boyle et al., 2012). Their sense of self-promotion and grandiosity also manifests in attention-seeking behaviours (O'Boyle et al., 2012; Vernon, Villani, Vickers, & Harris, 2008).

According to O'Boyle et al. (2012), the Dark Triad personality traits may predict acts of misbehaviour (e.g., self-undermining). They found that all three dimensions of the Dark Triad were positively related to counterproductive work behaviour, and that high scores on *Machiavellianism* and *Psychopathy* were associated with a decrease in the quality of job performance (O'Boyle et al., 2012). In another study, Jonason, Slompski, and Partyka (2012) investigated how the Dark Triad resulted in different workplace tactics that involved manipulation. Jonason and colleagues (2012) found that *Psychopathy* was related to tactics that centred on threats; *Narcissism* related strongly to tactics that involved the use of one's own appearance; and *Machiavellianism* was associated with workplace tactics that involved charm and overt manipulation. Furthermore, Baughman, Dearing, Giammarco, and Vernon (2012),

in their study amongst adults, investigated the relationships between the Dark Triad and bullying behaviour, and found that, of the three traits, *Psychopathy* was most strongly related to workplace bullying.

Regarding the relationship between the Dark Triad and the Big Five, research has shown that the personality traits that make up the Big Five have all been associated with one or more of the Dark Triad's dimensions (Furnham et al., 2013). For example, Paulhus and Williams (2002) conducted a study amongst students on the relationships between the Big Five and the Dark Triad. They found that all the dimensions of the Dark Triad were negatively related to *Agreeableness*; narcissists and psychopaths reported higher levels of *Extraversion*; Machiavellians and psychopaths displayed low *Conscientiousness*; and psychopaths reported low scores on *Neuroticism*. A correlation matrix between the Dark Triad and the Big Five personality traits reported in a study by Paulhus and Williams (2002) is depicted in Table 1, below.

Table 1

Correlation of the Dark Triad with the Big Five (cf. Paulhus & Williams, 2002)

Variable	*Narcissism*	*Machiavellianism*	*Psychopathy*
Extraversion	**.42**	-.05	**.34**
Agreeableness	**-.36**	**-.47**	**-.25**
Conscientiousness	-.06	**-.34**	**-.24**
Neuroticism	.02	.12	**-.34**
Openness to experience	**.38**	-.03	**.24**

Note. $n = 245$. All figures in bold indicate a significant correlation at $p < .05$, two-tailed.

1.2.5.3 Personality, job crafting, and self-undermining

Personality traits are considered powerful predictors of behaviour at work (Furnham, 2008). Indeed, Bakker and Costa (2014) forward that "personality influences the way people perceive their work environment, and therefore, how they deal with their job demands and job resources" (p. 113). Accordingly, because both job crafting and self-undermining involve the manipulation of job demands and job resources (Bakker, 2015; Bakker & Costa, 2014; Tims et

al., 2012), it can be expected that the personality traits of individuals will influence the extent to which they engage in job crafting and self-undermining behaviour.

To date, limited research has investigated the role that personality plays in predicting job crafting and, especially, self-undermining behaviour. Regarding job crafting, previous studies have focused more on specific individual difference variables, rather than basic personality traits (*cf.* Bipp & Demerouti, 2015). For example, Xie, Chen, Lei, Xing, and Zhang (2016) found that individuals with a resilient personality type reported higher levels of proactive behaviour (e.g., job crafting) than those with a more withdrawn personality type. In a study by Bakker, Tims, and Derks (2012), individuals with a proactive personality were indeed found to engage more in job-crafting behaviour. Lyons (2008), in a study amongst salespersons, examined how individual characteristics related to job crafting behaviour. Despite not having investigated personality as a construct in itself, results confirmed that individuals' self-image, perceived control, and readiness to change were all positively related to job-crafting behaviour. More recently, Bell and Njoli (2016) explored the Big Five personality traits as predictors of job crafting, and found that extraversion was the only non-significant predictor of job crafting. Interestingly, Roczniewska and Bakker (2016, in press) investigated how the Dark Triad predicted job crafting behaviour amongst of a sample of police officers, and reported the following: narcissism was positively related to seeking social job resources, seeking challenging job demands, and reducing job demands; psychopathy was negatively related to seeking social job resources. Roczniewska and Bakker (2016, in press) concluded that personality does indeed play an important role in the way employees choose to craft their work.

Similar to job crafting, there is scant research that investigated the individual antecedents to self-undermining behaviour, specifically the personality of individuals. While there is limited research that specifically looked at personality as a predictor of behavioural self-undermining, extant research does suggest that the 'dark side' of an individual's personality influences them to engage in other negative behaviours at work. For example, Baughman et al. (2012) found that the Dark Triad predicted bullying behaviour amongst working adults. Jonason, Slomski, and Partyka (2012), in another study, investigated the role of the Dark Triad in predicting tactics of workplace manipulation, and found that psychopathy and Machiavellianism were positively related to the adoption of hard manipulation tactics (e.g., threats). Furthermore, Crysel, Crosier, and Webster (2013) found that the Dark Triad is associated with impulsivity, sensation-seeking, and risky behaviour. Taken together, the personality of individuals,

especially their dark side, may influence the extent to which they engage in deviant workplace behaviours such as self-undermining.

1.2.6 Person–Job Fit

The notion of person–job fit refers to how well an individual's knowledge, skills, and abilities match the demands of the job (Edwards, 1991). It concerns the match between the individual's personal characteristics and the characteristics of the job itself (Lu et al., 2014). As a construct, person–job fit can be broken down into two dimensions, namely (1) demands–abilities (D-A) fit and (2) needs–supplies (N-S) fit. D-A fit denotes the compatibility between the employee's skills, knowledge, and abilities, and the requirements of the job itself, while N-S fit relates to the match between an employee's needs, preferences, or desires and what the job provides (Edwards, 1991; Kristof-Brown, Zimmerman, & Johnson, 2005).

Previous research has shown that person–job fit leads to positive organisational outcomes such as job satisfaction (Kristof-Brown et al., 2005; Lauver & Kristof-Brown, 2001; Peng & Mao, 2015), organisational commitment (Iplik, Kilic, & Yalcin, 2011), and overall job performance (Edwards, 1991; Han, Chiang, McConville, & Chiang, 2015). In their study amongst employees working in knowledge-intensive industries (i.e. pharmaceuticals, electronics, and information communication technology), Afsar, Badir, and Khan (2015) found that perceptions of person–job fit positively related to employees' innovative work behaviour, which subsequently predicted supervisors' ratings of their job performance. In another study, Han et al. (2015) found a positive relationship between person–job fit and contextual job performance. That is, the greater the fit between the person and the job, the more inclined the individual would be to engage in contextual performance (i.e. extra-role behaviour), thus highlighting the importance of person–job fit. Contradictory findings regarding person–job fit have also been noted. For example, De Beer, Rothmann, and Mostert (2016) applied a three-wave, crossed-lagged panel design in their study of the bidirectional relationship between person–job fit and work engagement over time. Their findings showed virtually no support for person–job fit as a predictor of work engagement over time, and, as such, they argue that person–job fit may not necessarily be a prerequisite for individuals to experience positive affective states such as work engagement.

1.2.6.1 Person–job fit and job crafting

As previously stated, job crafting can be used to create a better alignment between the job and the individual's skills, preferences, and abilities (Tims & Bakker, 2010; Tims et al., 2012). The proposed research argues that employees can improve their person–job fit through various job-crafting behaviours. Take, for example, an employee who is experiencing poor person–job fit due to the lack of performance feedback from his or her supervisor. This individual may craft the job by actively searching for feedback and advice from his or her supervisor (i.e. increasing social job resources, seeking resources), which in turn, may result in improved person–job fit. Improved person–job fit is important because it may result in positive outcomes such as improved wellbeing and job performance (Lin, Yu, & Yi, 2014).

While there is only a small body of research that documents the relationship between person–job fit and job crafting (*cf.* Tims et al., 2016), existing findings do seem promising. For example, in their recent three-wave study, Tims et al. (2016) found that job crafting improved person–job fit, which subsequently lead to increased experienced meaningfulness. Furthermore, Lu et al. (2014) found that engaged employees could improve their person–job fit through job-crafting behaviour. Lastly, Chen, Yen, and Tsai (2014) found that job crafting and person–job fit interact to affect an individual's levels of work engagement. These studies highlight the importance of job crafting in bringing about increased person–job fit. More specifically, they demonstrate how the manipulation of job characteristics (i.e. job crafting) can be used as a strategy to improve one's person–job fit, which may result in positive individual outcomes such as increased meaningfulness and work engagement. Moreover, the studies provide a new perspective regarding the way jobs are viewed. Traditionally, managers and organisations would design jobs and subsequently fill the position with an individual who best fits the job in terms of knowledge, skills, and ability. What these studies show, however, is that managers can hire employees who can, of their own account, create a better person–job fit by engaging in job crafting behaviours.

1.2.7 Job Performance

Amongst existing constructs, job performance is probably one of the most fervently explored. In fact, it has been called "the most widely studied criterion variable in the organizational behavior and human resource management literatures" (Bommer, Johnson, Rich, Podsakoff, & Mackenzie, 1995, p. 587). As a concept, job performance can be described as the aggregate value that an employee's discrete behavioural episodes contribute to the organisation over a

standard interval of time (Motowidlo, Borman, & Schmit, 1997). Others have defined the construct as the sum of behaviours and activities that are under the direct control of the individual, and which are considered important for accomplishing the goals of the organisation (Campbell et al., 1990; Rotundo & Sackett, 2002). Inherent to these definitions, although not overtly expressed, is that an individual's job performance is a critical element in the optimal functioning of the organisation, as, without it, the goals of the organisation would not be achievable.

According to Campbell et al. (1990), job performance is multi-dimensional, as no single attribute, outcome, or factor can represent the entirety of the construct. In fact, extant literature indicates that there are two conceptually distinct dimensions that make up the domain of job performance, namely task performance and contextual performance (Borman & Motowidlo, 1997; Carlos & Rodrigues, 2016; Motowidlo, Borman, & Schmit, 1997; Rotundo & Sackett, 2002). Task performance, also known as *in-role behaviour* (IRB), relates directly to the technical core of the organisation (Motowidlo & Van Scotter, 1994), and includes activities that are formally recognised as part of the job (Borman & Motowidlo, 1993) and which allow distinctions to be made across various types of jobs (Jawahar & Carr, 2007). On the other hand, contextual performance, or what is commonly known as *extra-role behaviour* or *organisational citizenship behaviour* (OCB), relates those activities that are discretionary (Motowidlo & Van Scotter, 1994) and which contribute to the maintenance of the organisational, social, and psychological context in which the technical core functions (Borman & Motowidlo, 1997). Examples of contextual activities or OCBs include volunteering to do work that falls outside one's job scope, helping colleagues to accomplish work tasks, and abiding by organisational rules, even when it is personally inconvenient (Borman & Motowidlo, 1997). According to Motowidlo and Van Scotter (1994), task performance is better predicted by differences in knowledge, skills, and abilities, whereas contextual performance is probably better predicted by individual differences in personality, motivation, and interpersonal skills.

Upon further scrutiny of the job performance literature, there seems to be evidence of another dimension that explains additional variance in the job performance construct, over and above that of task- and contextual performance, namely *counterproductive work behaviour* (CWB). This dimension of job performance has been described as voluntary behaviours that harm or intend to harm the wellbeing of the organisation and its members (Rotundo & Sackett, 2002;

Spector & Fox, 2005). It is to no surprise then that CWBs are closely related to aggression, in that both include acts that intend to harm (Spector, 2011). Examples of CWBs include purposefully working slow, withholding effort, theft, and acts of aggression (Jensen & Patel, 2011). Bolton, Becker, and Barber (2010) argue that it is important to not only understand this type of workplace behaviour, but also the individuals who are inclined to committing such devious acts.

1.2.7.1 Personality–performance relationship

Apart from situational variables (i.e. the characteristics of the organisation and the jobs embedded within it), job performance may also be affected by dispositional factors, such as an individual's personality (*cf.* Rothman & Coetzer, 2003). Indeed, previous meta-analyses have confirmed a relationship between personality and performance (see Barrick & Mount, 1991; Judge & Illies, 2002; Salgado, 1997). For example, Barrick and Mount (1991) found that conscientiousness was a valid predictor of job performance across all performance criteria (i.e. job proficiency, training proficiency and personnel data) and occupations, while the true-score correlations of the remaining Big Five traits (e.g., extraversion) varied by occupation and criterion type. Further, in a study conducted by Rothman and Coetzer (2003) within a South African pharmaceutical company, emotional stability (low neuroticism), openness to experience, and agreeableness were found to be practically and significantly related to the job performance of managers. More specifically, they found that openness to experience and conscientiousness were directly related to task performance, suggesting that individuals who score high on these two traits will perform their prescribed tasks better than those who score low. Contrary to Rothman and Coetzer's (2003) findings, Chu, Lee, Huang, and Li (2013) found that openness to experiences had no influence on teachers' job performance, yet their findings did offer support for a positive relationship between conscientiousness and job performance. In a similar fashion, Jawahar and Carr (2007) found that conscientious individuals were more inclined to engage in contextual performance with both their supervisor and the organisation.

Research has also demonstrated the negative effect that individuals' personality can have on their job performance and, in particular, their likelihood of engaging in CWB. Bolton et al. (2010), for instance, found that individuals who score low on agreeableness and conscientiousness reported more accounts of CWBs (e.g., workplace sabotage and

withdrawal), while Jensen and Patel (2011) found that individuals scoring high on both agreeableness and emotional stability were less likely to perform CWB. With specific reference to the Dark Triad of personality, meta-analytic findings concluded that the three Dark Triad dimensions are positively related to CWB (e.g., O'Boyle et al., 2012). Furthermore, Bekker and O'Hair (2007) found that Machiavellianism was negatively related to organisational citizenship behaviour and contextual performance, suggesting that individuals scoring high on Machiavellianism were less likely to engage in voluntary work behaviours that promote the positive self-image of the organisation, or to go beyond their prescribed role requirements. Interestingly, Eysenck (1993) and Woody and Claridge (1977) found that, of the Dark Triad, psychopathy is positively related to creative thinking and job performance.

1.2.7.2 Job crafting, self-undermining, and job performance

Individuals' job performance may not only be affected by their personality traits, but also by the various behaviours they engage in at work, such as job crafting and self-undermining. Research has found job crafting to lead to increased job performance (e.g., Bakker et al., 2012; Leana et al., 2009; Weseler & Niessen, 2016). Bakker et al. (2012), for example, found that job crafting positively predicted colleague ratings of in-role/task performance, while Weseler and Niessen (2016) found that employees who crafted their work by extending their task- and social boundaries reported higher levels of task performance. Leana et al. (2009), in their study amongst childcare teachers, also found a positive relationship between collaborative crafting and job performance, where collaborative crafting was defined as employees' collective effort in changing work processes. Furthermore, research conducted by Tims et al. (2013) found that individuals' job-crafting behaviours (i.e. increasing structural job resources) was positively related to increased job performance. In their attempt to investigate the longitudinal impact of job crafting on task performance during a period of organisational change, Petrou, Demerouti, and Schaufeli (2015) found that seeking resources (Time 1) was positively related to task performance (Time 2). Replicating these findings at the day level, Demerouti et al. (2015) found a positive relationship between daily seeking of resources and daily task performance.

Research has also demonstrated that self-undermining is related to job performance. According to Bakker (2015) and Bakker and Costa (2014), acts of behavioural self-undermining create obstacles for individuals, which may harm or undermine their performance. In their recent study, Bakker and Wang (in press) indeed found that behavioural self-undermining was

negatively related to supervisor ratings of job performance. In particular, individuals who engaged in self-undermining experienced increased levels of burnout, which subsequently hindered their performance at work.

1.3 OBJECTIVES OF THE STUDY

1.3.1 Main Objective

Understanding the factors that motivate or drive individuals to engage in job-crafting or self-undermining behaviour is important, as these may inevitably influence how employees perform and align themselves to their jobs and the extent to which their basic needs are satisfied at work. It was noted earlier that the individual antecedents of job-crafting and self-undermining behaviour are still relatively underexplored. Therefore, the main objective of this study was to investigate the individual antecedents of job crafting and self-undermining behaviour, and to determine the subsequent effects they have on specific workplace outcomes (i.e. person–job fit, job performance, and basic needs satisfaction).

1.3.2 Specific Objectives

The main objective of the study was achieved through three closely linked research articles. Each article had its own specific research objectives, which are outlined below:

1.3.2.1 Article 1

The questions answered in this phase of the study were:

Do the Job Crafting Scale, Job Crafting Questionnaire, and Self-Undermining Scale display sufficient construct validity in the South African working context?

Are the Job Crafting and Self-Undermining Questionnaires valid and reliable measures of their respective constructs in the South African working context?

Can these measures be confidently used to measure job crafting and self-undermining amongst South African working individuals?

Do any of the scale items appear problematic or show misfit to the Rasch measurement model?

Do the category response formats perform effectively in capturing job-crafting and self-undermining behaviour?

Are any of the items interpreted differently across age and gender groups, or do any of the items present differential item functioning?

1.3.2.2 Article 2

The questions answered in this phase were:

Does personality (i.e. Big Five and Dark Triad) predict job-crafting and self-undermining behaviour?

Do job-crafting and self-undermining behaviour mediate the relationship between personality (i.e. Big Five and Dark Triad) and job performance amongst South African employees? Stated otherwise, does the personality of individuals indirectly affect (influence) their job performance through job-crafting and self-undermining behaviour?

1.3.2.3 Article 3

The questions answered in this phase of the study were:

Do individuals craft their jobs on a weekly basis, and, as such, can job crafting be considered a 'week-level' phenomenon?

Does weekly job-crafting behaviour predict weekly basic needs satisfaction?

Does weekly basic needs satisfaction predict weekly person–job fit?

Does weekly job crafting increase weekly person–job fit through weekly needs satisfaction?

1.4 METHODOLOGY

1.4.1 Introduction

The following section provides a synopsis of the research methodology employed in the three independent research articles. Aspects such as the research respondents, research design, research procedure, measuring instruments, and statistical analyses for each article are discussed. The chapter concludes with the ethical considerations pertaining to the study.

1.4.2 Respondents

Using non-probability sampling, the three research articles targeted employees from the South African general working population. The samples obtained were diverse in ethnicity, and represented a number of different occupations. To participate in the research, individuals had to be proficient in English, had to have been employed full-time for a minimum of two years, had to be willing to participate in the study, and were required to be working for an employer (i.e. individuals who were self-employed were excluded).

1.4.3 Research Design

For the purpose of validating the three questionnaires (Article 1), and exploring personality as an antecedent to job crafting and self-undermining behaviour, and the subsequent effects on job performance (Article 2), a quantitative cross-sectional research design was used, which involves the collection of data at a single point in time (Gravetter & Forzono, 2009). For the third and final study (Article 3), a panel ('shortitudinal') research design was employed to test the weekly relationship between job crafting, basic needs satisfaction, and person–job fit. Shortitudinal research is similar to but different from longitudinal research in that it consists of relatively shorter time lags, with the potential to reveal essential information about the unfolding of psychological processes over time (*cf.* Dorman & Griffin, 2015). Essentially, shortitudinal research is built on the same premise as longitudinal research, in that they both consist of repeated measures administered to the same respondents over time (Long, 2012).

A weekly diary study was conducted in the third study, to measure job crafting, self-undermining, and job performance at the weekly level. A major advantage of diary studies is that they reduce the likelihood of retrospection, and they also illustrate how persons change over time with regard to particular variables of interest (Bolger, Davis, & Rafaeli, 2003; Ohly, Sonnetag, Niessen, & Zapf, 2010). According to Petrou et al. (2012), the value and strength of diary methods holds particularly true for job crafting.

1.4.4 Research Procedure

1.4.4.1 Article 1

An online survey was created containing access to a biographical information section and the three proposed workplace behaviour questionnaires. The survey was circulated via email to working individuals. In addition, the link was placed on a number of social and professional networking platforms that could easily disseminate the questionnaire to the public.

Respondents were encouraged to 'share' the link with their colleagues and any other interested parties that may be willing to participate in the study. The link to the survey was accompanied by a short description of the study and the minimum requirements for participation. Upon clicking on the link, the respondents were presented with a preface to the questionnaire, which explained the purpose of the study and the anonymous, confidential, and voluntary nature of it. Recurring emails and posts were sent to remind respondents to participate. The data collection period ran for three consecutive months (January 2017 to March 2017), and the final data set was captured and stored in a secure location.

1.4.4.2 Article 2

As part of their course work in a research methodology module, undergraduate students were requested to administer the questionnaires to South African working individuals. Students were instructed to find individuals who had been working for a minimum of one year, who were proficient in English, and who were willing to participate in the research. The sealed envelopes contained a biographical questionnaire and the instruments used to capture the variables under study. In addition, a cover letter accompanied the questionnaires, which explained the purpose of the study. The respondents were informed that confidentiality and anonymity would be upheld, and that participation was voluntary. They were also provided with the contact details of the researcher. Once the respondents had completed the surveys, they were requested to place these in the envelope provided and seal. The collected envelopes were stored in a secure location. The research was approved by the Ethics Committee of the University of Johannesburg.

1.4.4.3 Article 3

Respondents were recruited via postgraduate (honours) students enrolled in a research methodology module who, as part of their course work, were requested to administer a weekly diary booklet to individuals who were currently employed in the South African workforce. The use of student-recruited sampling methods is associated with a number of advantages, including heterogeneity of the sample, cost reduction, student learning, and elaborate research designs (*cf.* Demerouti & Rispens, 2014). In the present study, using paper-and-pencil methods, respondents were instructed to complete one (of four) diary booklets at the end of each work week (i.e. every Friday). A weekly email was sent to respondents to remind them to participate in the study. Each week, respondents were requested to complete a questionnaire that measured

their weekly job crafting behaviour, weekly needs satisfaction, and their weekly P-J fit. The respondents' biographical information was only assessed in the first week of the diary study. In conjunction to having the right to withdraw from the study at any point in time, the respondents were informed that their anonymity was assured, and that their responses would remain confidential. Furthermore, the contact details of the researcher was provided in the event that any uncertainties arose regarding the research process.

1.4.5 Measuring Instruments

1.4.5.1 Article 1 (Validation study)

1.4.5.1.1 Job crafting

Tims et al.'s (2012) Job Crafting Scale (JCS), consisting of 21 items, was used to measure job crafting. The scale consists of four dimensions, namely *Increasing structural job resources* (e.g., "I try to develop my capabilities"), *Increasing social job resources* (e.g., "I ask my supervisor to coach me"), *Increasing challenging job demands* (e.g., "If there are new developments, I am one of the first to learn about them and try them out"), and *Decreasing hindering job demands* (e.g., "I make sure that my work is mentally less intense"). Responses are rated on a Likert-type scale ranging from *1* (*Never*) to *5* (*Very often*). A recent study conducted by Eguchi et al. (2016) reported Cronbach alphas ranging between .76 and .90 for the four job crafting dimensions.

Slemp and Vella-Brodrick's (2013) Job Crafting Questionnaire (JCQ), consisting of 15 items, was also used to measure job crafting behaviour. The scale measures three dimensions, namely *Task crafting* (e.g., "I introduce new approaches to improve my work"), *Relational crafting* (e.g., "I make an effort to get to know people well at work"), and *Cognitive crafting* (e.g., "I think about how my job gives my life purpose"). Respondents are asked to rate the extent to which they engage in specific types of job crafting behaviours on a Likert-type scale ranging from *1* (*Hardly ever*) to *6* (*Very often*). Slemp and Vella-Brodrick (2013) reported a Cronbach alpha of .91 for the total JCQ, while internal consistencies ranged from .83 to .89 for the three job crafting dimensions.

1.4.5.1.2 Self-undermining

The Self-Undermining Scale (Bakker & Wang, in press) was used to assess employees' self-undermining behaviour. The scale consists of six items, measured on a seven-point Likert-

type scale ranging from *1* (*Strongly disagree*) to *7* (*Strongly agree*). An example item is "I admit that I create stress at work." Bakker and Wang (in press) administered the Self-Undermining Scale across four countries, the US (α = .87), Chile (α = .70), Romania (α = .79), and the Netherlands (α = .73), and found that the scale produced satisfactory reliability scores.

1.4.5.2 Article 2 (Personality as an antecedent to job crafting and self-undermining)

1.4.5.2.1 The Big Five personality traits

The Basic Traits Inventory (Taylor & De Bruin, 2006) was used to measure the Big Five personality traits. The BTI has shown cross-cultural validity in the South African context (Taylor & De Bruin, 2006). In particular, the shortened version of the BTI was used, which consists of 60 items that are rated on a five-point Likert-type scale ranging from *1* (*Strongly disagree)* to *5* (*Strongly agree).* The scale has produced satisfactory internal consistency, with alpha coefficients ranging from .90 (*Agreeableness*) to .95 (*Neuroticism*) (Metzer, De Bruin, & Adams, 2014).

1.4.5.2.2 Dark Triad

The Dark Triad of Personality (D3-Short) (Paulhus, 2013) was used to assess the three dimensions of the Dark Triad. The scale consists of 27 items and measures three dimensions: *Machiavellianism* (e.g., "You should wait for the right time to get back at people"), *Narcissism* (e.g., "I have been compared to famous people"), and *Psychopathy* (e.g., "Payback needs to be quick and nasty"). Responses are rated on a five-point Likert scale ranging from *Strongly disagree* (*1*) to *Strongly agree* (*5*). Previously reported Cronbach alphas for the subscales were .78 (Machiavellianism), .77 (Narcissism) and .80 (Psychopathy) (Paulhus & Jones, 2011).

1.4.5.2.3 Job crafting

Slemp and Vella-Brodrick's (2013) Job Crafting Questionnaire (JCQ), consisting of 15 items, was used to measure job crafting behaviour. The scale measures three dimensions, namely *Task crafting* (e.g., "I introduce new approaches to improve my work"), *Relational crafting* (e.g., "I make an effort to get to know people well at work"), and *Cognitive crafting* (e.g., "I think about how my job gives my life purpose"). Respondents are asked to rate the extent to which they engage in specific types of job-crafting behaviours on a Likert-type scale ranging from *1* (*Hardly ever*) to *6* (*Very often*). Slemp and Vella-Brodrick (2013) reported a Cronbach

alpha of .91 for the total JCQ, while internal consistencies ranged from .83 to .89 for the three dimensions.

1.4.5.2.4 Self-undermining

The Self-Undermining Scale (Bakker & Wang, in press) was used to assess employees' self-undermining behaviour. The scale consists of six items, measured on a seven-point Likert-type scale ranging from *1* (*Strongly disagree*) to *7* (*Strongly agree*). An example item is: "I admit that I create stress at work." Bakker and Wang (in press) administered the Self-Undermining Scale across four countries, the USA (α = .87), Chile (α = .70), Romania (α = .79), and the Netherlands (α = .73), and reported satisfactory reliability scores.

1.4.5.2.5 Job performance

Williams and Anderson's (1991) scale of job performance was used to measure individuals' job performance. The scale measures three classes of employee behaviour, namely *Organisational citizenship behaviours directed towards a specific individual* (*OCB-I*) (e.g., "I help others who have heavy workloads"), *Organisational citizenship behaviours directed towards the organisation* (*OCB-O*) (e.g., "I conserve and protect organisational property"), and employees' *In-role behaviour* (*IRB*) (e.g., "I adequately complete assigned duties"). The scale consists of 21 items, and responses are measured on a seven-point Likert-type scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Satisfactory Cronbach alpha of .91 (IRB), .88 (OCB-I), and .75 (OCB-O) have been reported for the three subscales (Williams & Anderson, 1991).

The final job performance dimension that was assessed was *CWB*, which was measured with the ten-item short version of the Counterproductive Work Behaviour Checklist (CWB-C) (Spector et al., 2006). Respondents are requested to rate, on a seven-point Likert-type scale (*1 = Never, 7 = Every day*), how often they engage in certain workplace behaviours. An example item is: "Came to work late without permission." Spector, Bauer, and Fox (2010) reported an average Cronbach alpha of .78 for the two employee forms, and .89 for the two supervisor forms.

1.4.5.3 Article 3 (Weekly diary study)

1.4.5.3.1 Weekly basic needs satisfaction

The Basic Psychological Needs Scale — Work Version (Ilardi, Leone, Kasser, & Ryan, 1993) was used to assess employees' weekly satisfaction of their basic psychological needs. The scale consists of 21 items that measure three dimensions, namely *Autonomy satisfaction* (e.g., "This week, I was free to express my ideas and opinions on the job"), *Competence satisfaction* (e.g., "This week, people at work told me I am good at what I do"), and *Relatedness satisfaction* (e.g., "This week, I really liked the people I worked with"). Responses are rated on a seven-point Likert scale ranging from *1* (*Strongly disagree*) to *7* (*Strongly agree*). A previous study administered the scale amongst two samples and reported Cronbach alpha of .83 (Bulgarian sample) and .89 (American sample) (Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001).

1.4.5.3.2 Weekly job crafting

The Job Crafting Questionnaire (JCQ: Slemp & Vella-Brodrick, 2013) was used to measure individuals' weekly job crafting behaviour. The 15 items that make up the scale were adapted to reflect week-level changes in individuals' task, relational, and cognitive crafting behaviour respectively. An example item is: "This week, I introduced new approaches to my work." Responses are rated on a seven-point Likert-type scale (*1 = Strongly disagree*, *7 = Strongly agree*). Slemp and Vella-Brodrick (2013) reported a Cronbach alpha of .91 for the total JCQ, while internal consistencies ranged from .83 to .89 for the three job crafting dimensions.

1.4.5.3.3 Weekly person–job fit

Saks and Ashforth's (1997) scale was used to measure employees' perceptions of their weekly person–job fit. The scale consists of four items that are rated on a seven-point Likert-type scale (*1 = To a very little extent*, *7 = To a very large extent*). The items were adapted to reflect an individual's perception of person–job fit for that particular week. An example item is: "This week, my job was a good match for me." De Beer, Rothmann Jr., and Mostert (2016), in their three-wave study, reported Cronbach alphas of .86 (Time 1), .84 (Time 2), and .82 (Time 3) respectively.

1.4.6 Statistical Analyses

1.4.6.1 Article 1

In the first article, a Rasch analysis was performed using *Winsteps* (Linacre, 2012). The Rasch measurement model (Rasch, 1960) is a member of the larger family of item response theory

models (Embretson, 1996; Fischer & Molenaar, 1994; Van der Linden & Hambleton, 1997), and is considered a more modern psychometric approach to validation (Tennant, Mckenna, & Hagell, 2004). Conducting a Rasch analysis allows one to evaluate the psychometric properties (e.g., reliability and validity) of existing measurement instruments in more detail than traditional classical test theory approaches do (Boone, Staver, & Yale, 2014; Hagquist, Bruce, & Gustavsson, 2009). While the scales used in the first study have been validated using classical test theory approaches (e.g., exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)), to date, there have been no studies that validated the instruments from an item-response theory perspective.

The three scales (i.e. the JCS, JCQ, and the Self-Undermining Scale) were assessed for unidimensionality, item fit, rating-scale functionality, reliability, and differential item functioning (DIF) across age and gender. Both infit and outfit mean square (MNSQ) statistics were inspected for item- and person fit. In addition, the item characteristics curves (ICCs) were observed to determine whether item misfit was present (i.e. the item did not function in accordance with the Rasch model). To explore rating-scale functionality, inspection of the category probability curves, category fit statistics, and category thresholds was undertaken. With respect to the reliability of the instruments, both person- and item reliability, as well as their respective separation indexes, were investigated. Lastly, to determine whether item bias was present, an inspection of the DIF contrasts and significance values was performed.

1.4.6.2 Article 2

In the second article, all statistical analyses were carried out using *R Version 3.1.3* (R Core Team, 2015), which enables one to perform statistical techniques such as factor analysis and structural equation modelling (Culpepper & Aguinis, 2011). The *Psych* (Revelle, 2015), *Lavaan (*Yves, 2012), and *semTools* (SemTools Contributors, 2015) packages, in particular, were employed in the analyses. The descriptive statistics (i.e. mean, standard deviation, skewness and kurtosis, and reliability) of the scales were explored to assess the basic features of the data set, and Pearson's product-moment correlation was used to determine the strength of the linear relationships between the study variables. The reliabilities of the scales were examined by means of Cronbach's (1951) alpha, and reliability coefficients greater than .70 were considered acceptable (Netemeyer, Bearden, & Sharma, 2003).

To test the hypothesised relationships between the research constructs, structural equation modelling (SEM) was performed, which, according to Schreiber et al. (2006), allows researchers to investigate how constructs are theoretically linked in terms of their significance and directionality. The SEM analysis consisted of two main components, the measurement component (i.e. CFA) and the structural component. Model fit was determined by assessing the goodness-of-fit statistics, including the incremental fit indices (i.e. X^2, Tucker Lewis Index (TLI)) (Tucker & Lewis, 1973), confirmatory fit index (CFI) (Bentler, 1990), the absolute fit indices (i.e. root mean square error of approximation (RMSEA)) (Steiger & Lind, 1980), and standardised root mean square residual (SRMR). For the CFI and TLI, values greater than .90 were indicative of good fit, and for the RMSEA and SRMR, values less than .08 were considered a good fit (Brown, 2015; Brown & Cudeck, 1993; Hu & Bentler, 1999; Marsh, Hau, & Wen, 2004). The estimation method used for estimating the model parameters was weighted least squares mean and variance adjusted (WLSMV), and McDonald's (1999) omega hierarchical (ω_h) was used to report model reliability.

1.4.6.3 Article 3

In the third and final article, all statistical analyses were again carried out using *R Version 3.1.3* (R Core Team, 2015), which, according to Culpepper and Aguinis (2011), provides researchers the opportunity to implement statistical techniques such as multilevel modelling. The *Psych* (Revelle, 2015), *Lavaan* (Yves, 2012), *Nlme* (Pinheiro et al., 2016) and the *Lme4* (Bates, Maechler, Bolker, & Walker, 2015) statistical packages, in particular, were employed to run the analyses, and maximum likelihood (ML) was used as the estimation method.

The multilevel nature of the data called for an appropriate multilevel analytic tool. Accordingly, linear mixed effects regression (LMER) was chosen as the statistical method to analyse the data, which not only allows for the examination of predictors of change, but also associates subjects with their repeated measures (Long, 2012). The data consisted of two levels, where week-level data (Level 1: within-persons) was nested within the person (Level 2: between-persons). Long (2012) describes between-person variability as the variation that is due to individual differences, whereas within-person variability is an indication of variance that is due to changes in the response variable over time. As a prerequisite for conducting multilevel modelling (MLM), the data were analysed in long format.

Prior to conducting the multilevel analyses, the intraclass correlation coefficients (ICCs) were calculated for each variable, to determine the appropriateness of using MLM. The ICC, also known as the 'cluster effect,' describes the amount of variance in the outcome variable that is accounted for between persons (Level-2 units) (Hox, 2002; Raudenbush & Bryk, 2002), and ranges from 0 to 1, with higher values indicating greater between-person variance. Furthermore, the statistical analyses accounted for both random and fixed effects; both random intercept and slope models were investigated to determine whether random effects indeed existed. To provide for clearer interpretation of the variances in the random intercept and slopes (Hox, 2002), all the independent variables were group-mean centred; that is, the individual's group mean was subtracted from the individual's score.

To compare the random intercept model to the random intercept and slope model, analysis of variance (ANOVA) was used, whereby the following fit indices were compared: the chi-square (X^2) goodness-of-fit test, the Akaike information criterion (AIC), and the Bayesian information criterion (BIC). The AIC and BIC are particularly useful for comparing different models, and the model that produces the smallest coefficients for these two criteria is considered the best-fitting model (Heck & Thomas, 2009; Netemeyer, Bearden, & Sharma, 2003). Furthermore, the statistical significance of each model was assessed by means of investigating the *p*-value, which is produced from the likelihood ratio test (LRT), which, according to Hayes (2006), involves comparing the deviances of two models. Those *p*-values equal to or less than 0.05 were considered statistically significant (Long, 2012).

1.4.7 Ethical Considerations

Maintaining a strong ethical stance throughout the entire research endeavour is critical in upholding the public's respect for scientific and academic communities and in making a meaningful contribution to further knowledge (Shaughnessy, Zechmeister, & Zechmeister, 2003). Evans (2009) further emphasises that "the vital role played by ethics in the planning, execution, and reporting of quantitative and qualitative research cannot be overstated" (p. 10). The following section discusses the ethical aspects that were taken into consideration for the current research.

According to Evans (2009), it is the responsibility of the researcher to avoid plagiarism and respect intellectual property. In accordance with the policies set out by the University of Johannesburg, all pages and chapters embedded within this document were scanned through

an Internet-based plagiarism detection service, Turnitin (Turnitin, n.d.), to determine whether correct referencing was adhered to and to ensure that there were no incidences of plagiarism. Furthermore, permission was granted from the test publishers (JvR) to use their instruments in the current research.

All the research questionnaires were accompanied by a preface that outlined a number of ethical aspects pertaining to the research. In particular, the preface explained the purpose of the research, informed the respondents that their participation was completely voluntary, and emphasised that their anonymity would be assured at all times. The preface further notified respondents that they could withdraw from the research at any point, and that all their responses would remain strictly confidential, with only the research team having access to the data. Informed consent was granted by the respondents upon their completion of the questionnaires. Furthermore, the data obtained from each study were stored in a secure location, and all the data files were password-protected. The contact details of the researchers were also provided to respondents, in case they had any uncertainties regarding the research. Ethical clearance was obtained from the Faculty Ethics Committee of the Faculty of Management at the University of Johannesburg.

1.4.8 Chapter Summary

This chapter provided an introduction to and overview of the current research study. The specific aims and objectives of each article were discussed, and a brief literature overview of the research constructs was provided. The research methodologies employed in each article were outlined, and the ethical considerations pertaining to the research were addressed. Chapter 2 reports the results of the Rasch analyses of the three organisational behaviour measures.

CHAPTER 2: A RASCH ANALYSIS OF THE THREE ORGANISATIONAL BEHAVIOUR MEASURES

ABSTRACT

The study of human behaviour in the workplace requires the application of psychometrically sound instruments. Through a Rasch model application, the current study investigated the psychometric properties of three organisational behaviour measures, namely the job crafting questionnaire (JCQ), the job crafting scale (JCS) and the Self-Undermining Scale. A sample (n = 318) of employees from the South African working population was obtained, and the instruments were analysed with respect to their unidimensionality, item fit, category functioning, and reliability. Furthermore, DIF was explored across two sub-groups, namely age and gender. Although the instruments showed good internal consistency, there were a few problematic items that were flagged during the Rasch analysis, based on item misfit or the inability to work invariantly across groups. Greater insights into the categorisation of items was further obtained. Recommendations for future research are provided.

Key words: Job crafting, self-undermining, scale validation, Rasch measurement model

2.1 INTRODUCTION

Two types of workplace behaviour that have recently come under interest to researchers and organisations alike are job crafting (see Van den Heauvel, Demerouti, & Peeters, 2015; Van Wingerden, Bakker, & Derks, 2016) and self-undermining behaviour (see Bakker, 2015; Bakker & Demerouti, 2016). The rise in research attention may be attributed to the fact that both job crafting and self-undermining behaviours impact the well-being and performance of employees. Specifically, job crafting has shown to lead to increased work engagement (Bakker, Rodríguez-Muñoz, & Sanz-Vergel, 2015; Peral & Geldenhuys, 2016), job satisfaction (Berg, Dutton, & Wrzesniewski, 2008), and job performance (Tims, Bakker, & Derks, 2015), while self-undermining, on the other hand, results in excessive job demands (e.g., work pressure, role conflict), exhaustion, and impaired job performance (Bakker & Costa, 2014; Bakker & Wang, in press). It is thus important to give special consideration to these workplace behaviours, as they may have an impact on the company's bottom line.

Conceptually speaking, *job crafting* refers to a self-initiated process of an individual making physical and/or cognitive changes to a job that result in a better fit between the individual and the job (Wrzesniewski & Dutton, 2001). Bakker, Tims, and Derks (2012) define job crafting as the proactive changes that employees make to their jobs in order to align their working conditions to their own needs and abilities. *Self-undermining* refers to undesirable workplace behaviours that individuals engage in that negatively impact their job performance (Bakker, 2015; Bakker & Wang, in press) and sabotage their work experiences.

Whereas ample research has focused on the outcomes of engaging in these two forms of workplace behaviours and the relationships they possess with other variables of research interest (i.e. job performance, work engagement, and burnout), little research has focussed explicitly on the design of the instruments used to capture these organisational behaviours. Three instruments in particular have been developed to measure job crafting and self-undermining behaviours, namely the job crafting scale (JCS; Tims, Bakker, & Derks, 2012), the job crafting questionnaire (JCQ; Slemp & Vella-Brodrick, 2013), and the Self-Undermining Scale (Bakker & Wang, in press), all of which are based on underlying principles of JD-R theory (Bakker & Demerouti, 2016). These instruments are analysed in the present paper. The rationale for selecting two job crafting measuring instruments was primarily due to their conceptual differences in measuring job crafting behaviour. The JCS focuses explicitly on the changes that employees make to their job demands and job resources, while the JCQ directly measures the various forms of job crafting behaviour (i.e. task, relational, and cognitive) that were originally proposed by Wrzesniewski and Dutton (2001). The Self-Undermining Scale is a newly developed instrument that can be used to detect concrete self-undermining behaviours at work, to prevent negative work experiences from occurring, such as job strain and burnout (Bakker & Wang, 2016). However, the scale has not undergone any validation efforts since its development, and, as such, an investigation of its psychometric properties was warranted.

The psychometric properties of the above-mentioned instruments have previously been validated using traditional classical test theory (CTT) approaches such as EFA and CFA (see Chinelato, Ferreira, & Valentini, 2015; De Beer, Tims, & Bakker, 2016). The present study, however, investigated the psychometric properties of the proposed instruments by adopting what Tennant, Mckenna, and Hagell (2004) consider a more *modern* psychometric approach, which presents itself in the form of Rasch measurement model applications (Rasch, 1960).

Iramaneerat, Smith Jr., and Smith (2008) note that observations of phenomena (e.g., job crafting and self-undermining) in the social sciences are commonly made using ordinal data, which are inappropriate for parametric statistical testing, due to the non-linear nature of the data. Therefore, to ensure that the data obtained from ordinal scaled data are suitable for parametric testing, it is important that the raw ordinal data be transformed to equal-interval (linear) measures, as working with non-linear (ordinal) data may lead to inaccurate statistical conclusions (Boone, Staver, & Yale, 2014). The Rasch measurement model is such a useful tool for converting ordinal (non-linear) data into linear (equal-interval) measures (Fischer, 1995; Linacre, 2016a; Rasch, 1960). Tennant and Conaghan (2007) advance that "the Rasch measurement model is now firmly established as the standard for modern psychometric evaluations of outcome scales […] which provides a powerful tool for bringing together key issues such as unidimensionality, category ordering, and DIF (differential item functioning) within the framework of measurement science" (p. 1361). Hagquist, Bruce, and Gustavsson (2009) add that the Rasch model is highly useful for the rigorous examination of measurement instruments.

The present study is unique in that it is the first of its kind to examine the psychometric properties of the proposed instruments from a perspective other than CTT, therefore offering a new lens for the development and validation of existing instruments. It also provides an illustrative example of how Rasch model applications can be used to thoroughly investigate the psychometric properties of existing ordinal scales, where aspects such as category functioning, item fit, and DIF are addressed. Finally, it sheds light on the importance of converting raw ordinal data into equal-interval measures prior to proper statistical conclusions being made.

2.2 LITERATURE REVIEW

2.2.1 Introduction

The following literature review conceptualises the two variables of interest, namely job crafting and self-undermining behaviour. Thereafter, a detailed discussion is provided on the development of the measurement instruments investigated in this study. In addition to this, the core foundations of the Rasch measurement model are explained, and its usefulness in evaluating the psychometric properties of measurement instruments is elaborated upon.

2.2.2 What is job crafting and self-undermining?

2.2.2.1 Job crafting

Job crafting is, in essence, a proactive workplace behaviour that employees engage in for the purpose of creating a better alignment between themselves and their job (Berg, Grant, & Johnson, 2010). It is regarded as proactive because employees are required to take the initiative in making changes to their jobs, as opposed to being told what to do. This description is aligned with Cant's (2000) definition of proactive behaviour as "taking initiative in improving current circumstances or creating new ones" (p. 436). Demerouti (2014) states that organisations can encourage employees to engage in job-crafting behaviour to improve their working conditions.

Perhaps the most-cited definition of job crafting is that of Wrzesniewski and Dutton (2001), who defined it as "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (p. 179). This conceptualisation suggests that employees can make changes to their jobs by physically changing the tasks they perform (i.e. the number of tasks that are completed and the manner in which they are completed) and the social relationships they engage in (i.e. changing the frequency of interaction with colleagues or establishing new relationships); or they may change their job by adjusting their work-related cognitions (i.e. the way they think about the job). More recently proposed definitions of job crafting strictly position and label the construct within the framework of the JD-R Model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). For example, Petrou, Demerouti, Peeters, Schaufeli, and Hetland (2012) define job crafting as the proactive behaviours that employees engage in, such as seeking job resources, seeking challenges, and reducing job demands, whereas Tims, Bakker and Derks (2016) refer to it as the self-owned actions that employees use to change their job demands and job resources.

In their original work, Wrzesniewski and Dutton (2001) propose some beneficial outcomes for 'job crafters,' which include alterations to the meaning of work and one's overall work identity. This implies that individuals may craft their jobs to find increased meaningfulness and purpose in their overall work experience. According to Berg et al. (2008), job crafting can also greatly influence both individual and organisational performance. Findings from both cross-sectional and longitudinal research studies indeed provided support for this claim (Gordon, Demerouti, Le Blanc, & Bipp, 2015; Tims et al., 2015). Furthermore, the implementation of job-crafting interventions in organisation has shown that job crafting can decrease employees' negative

affect towards the job and increase their feelings of self-efficacy (Van den Heuvel, Demerouti, & Peeters, 2015). Based on the positive outcomes that are derived from job-crafting behaviour, it is no surprise that research on job crafting has increased significantly over the past decade (Rudolph, Lavigne, Katz, & Zacher, 2017, in press).

2.2.2.2 Self-undermining

Self-undermining is an emerging concept that has not received much research attention in the organisational behaviour literature. Accordingly, Bakker and Wang (2016) contend that little is known about the self-undermining behaviours that employees engage in at work, particularly those who experience high levels of job stress. In terms of its conceptualisation, *self-undermining* refers to enduring undesirable workplace behaviours that impair an individual's job performance (Bakker & Wang, 2016) or what Bakker (2015) refers to as "behaviour that creates obstacles that may harm performance" (p. 725). According to the Oxford Online Dictionary, *undermine* means "to lessen the effectiveness, power, or ability of," and is synonymous with concepts such as sabotage, weaken, diminish, and impair (Oxford Dictionary, 2017). Therefore, it is plausible to argue that self-undermining is a self-initiated behaviour that hinders (i.e. impairs, weakens, diminishes, sabotages) an individual's overall ability and effectiveness at work. Examples of self-undermining behaviours include poor communication, creating conflict with co-workers, making mistakes, and avoiding people altogether (Bakker, 2015). Engaging in any of these forms of self-undermining behaviour may lead to employees finding their work tasks more difficult to carry out, due to the increased pressure they experience as a result of the barriers created by their self-undermining acts.

A concept that is closely related to but different from self-undermining is *self-handicapping*, which refers to a self-defensive manoeuvre in which an individual creates obstacles (i.e. handicaps) for him- or herself in anticipation of failing (Jones & Berglas, 1978). These obstacles or handicaps are created so that, if and when the individual fails to perform, he or she can protect his or her self-esteem by shifting the blame onto the obstacle or handicap, instead of blaming his or her own inability to perform. A prime example of self-handicapping behaviour is a student going out to a party the night before an exam. Upon receiving a poor grade for the exam, the student shifts the blame onto the party that he or she attended, as opposed to his or her inability to study the night before, and, in doing so, preserves his or her self-esteem. The difference between self-handicapping and self-undermining is that self-

handicapping refers to excuses for one's impaired performance, whereas self-undermining refers actual, concrete undermining behaviours that negatively impact an individual's work performance (Bakker & Wang, 2016). Bakker and Wang (2016) further note that self-undermining focuses specifically on behaviours that occur at work, while self-handicapping is context-free and can apply to all life domains.

Self-undermining behaviour has been construed within the framework of the JD-R Model and, particularly, in relation to the health impairment process. Bakker, Demerouti, and Van Mierlo (2015), for example, found that individuals who faced higher weekly job demands were more inclined to report self-undermining behaviours. Corroborating these findings, Bakker and Wang (2016) found that self-undermining behaviour was positively related to high job demands and burnout, and negatively related to job performance. These findings suggest that individuals who engage in self-undermining behaviour as a result of high job demands create additional unnecessary job demands (e.g., role ambiguity, work pressure, and emotional demands), which may lead to them being emotionally exhausted and/or burned out. Once burnt out, employees lack the motivation and effort required to fulfil their job roles, which will result in more mistakes being made (due to the lack of concentration) and the individual's job performance subsequently being affected. Taken together, self-undermining can be regarded as undesirable workplace behaviour that can result in a vicious downward spiral of high job demands, burnout, and impaired performance, which can be costly, both in terms of the wellbeing of the employee and the overall effectiveness of the organisation.

2.2.3 The Measuring Instruments

2.2.3.1 The Job Crafting Scale

Due to the idea that extant job crafting research has been primarily theoretical or qualitative in nature, Tims et al. (2012) believed that the field was in need of a generic scale that could quantitatively measure the job crafting construct, as opposed to a scale that focused specifically on a single profession (e.g., Leana, Applebaum, & Shevchuk, 2009).

Their original conceptualisation of the *job crafting* construct consisted of three dimensions, namely (1) *Increasing job resources* (which includes both structural and social forms), (2) *Increasing challenging job demands*, and (3) *Decreasing hindering job demands*, and was defined as the changes that employees may make to their jobs in order to balance their job demands and job resources with their own personal needs and abilities (Tims et al., 2012). The

scale development and validation process spanned over three consecutive studies, which are discussed below.

Study 1

The primary goal of the first study was to develop and test the JCS. The creators of the instrument initially compiled a pool of 42 items, which were rated on a five-point frequency response format (*1 = Never*, *2 = Seldom*, *3 = Regularly*, *4 = Often*, *5 = Very often*) was developed to capture the three proposed job crafting dimensions. Prior to any data collection efforts, the authors engaged in conversation with three I/O psychologists who were currently doing their PhD, to assess the content of the items and the proposed definition of the *job crafting* construct. Thereafter, an online questionnaire, which was administered in Dutch, was used to capture data on the JCS. A final data set of 375 responses was captured from both full-time and part-time workers, which was then subjected to further analysis.

Upon completion of EFA on the original 42 items, a total of 21 items were deleted due to discrepancies. To the surprise of the authors, it became evident during the EFA that a four-factor structure best represented the *job crafting* construct, as opposed to the three-factor structure originally proposed. Subsequently, due to conceptual differences in item content, *Increasing job resources* was further divided into two dimensions, namely *Increasing social job resources* and *Increasing structural job resources*. The resultant four-factor solution produced the following reliability coefficients: *Increasing social job resources*: α = .77, *Increasing structural job resources*: α = .82, *Increasing challenging job demands:* α = .75, and *Decreasing hindering job demands*: α = .79.

Study 2

Using CFA, the aim of the second study was to cross-validate the JCS to see whether the four-factor structure held true across different samples. In addition to this, the convergent validity of the scale was tested in relation to constructs such as *proactive personality*, *personal initiative*, and *cynicism* (for a discussion on construct choice, see Tims et al., 2012).

The 21-item JCS, as well as the Personal Initiative, Proactive Personality, and Cynicism Scales were administered to two new Dutch samples (Sample 1 n = 415; Sample 2 n = 201). To assess model fit, the following fit indices were examined: chi-square/*df* ratio, comparative fit index (CFI), TLI, Incremental Fit Index (IFI), and the root mean square error of approximation

(RMSEA). As expected, the four-factor model produced the best fit (X^2/df = 2.17; CFI = .90; TLI = .88; IFI = .90; RMSEA = .04). Regarding the invariance of the JCS, both an unconstrained and fully constrained model, using multigroup analysis, were tested simultaneously across the samples. Factor loadings, factor variances, and factor covariances provided support for the invariance of the JCS. Furthermore, the JCS displayed good reliability across the samples, ranging from .72 to .88.

As far as convergent validity is concerned, all *Job crafting* dimensions correlated positively with *Proactive personality*, while only three of the four correlated positively with *Personal initiative* (*Decreasing hindering job demands* being the exception). With regard to *Cynicism*, three of the four *Job crafting* dimensions (*Decreasing hindering job demands* being the exception) had significant negative relationships with *Cynicism*.

Study 3

The final step in validating the JCS was to investigate its criterion validity against constructs such as *work engagement*, *employability*, and *in-role performance*, all of which are expected outcomes of engaging in job-crafting behaviour. Data on 95 dyads (n = 190) were collected from various organisations in the Netherlands.

Findings revealed that the four *Job crafting* dimensions were significantly related to work engagement, where *Decreasing hindering job demands* was the only dimension that was negatively related to work engagement. All the *Job crafting* dimensions (except for *Decreasing hindering job demands*) were significantly and positively related to *Employability*. *Decreasing hindering job demands* was the only *Job crafting* dimension that did not bear any significance to *Job performance* (all three *Increasing* dimensions were significant and positively related to *Job performance*). Finally, the JCS performed reliably, with alpha coefficients ranging from .73 to .77.

2.2.3.2 The Job Crafting Questionnaire

Although Slemp and Vella-Brodrick (2013) acknowledged job crafting as a promising basis for workplace interventions, they proclaimed that there was still a need to empirically assess job crafting and its relationship to other employee outcomes. Supporting Tims et al.'s (2012) argument, Slemp and Vella-Brodrick (2013) believed that existing job crafting scales (i.e. Ghitulescu, 2006; Leana et al., 2009) were not suitable for application across general working

populations. As a result, their attempts to create a new instrument to measure job crafting were based on two underlying premises: first, due to the predominantly qualitative research that had been conducted on job crafting, they felt that there was a shortage of available scales that reliably and validly measure the construct across general working populations; second, and most important, they sought to develop a scale that directly measured the cognitive component of job crafting, since they believed that those already in existence did not adequately do so.

Slemp and Vella-Brodrick (2013) defined job crafting as a process that employees engage in with the aim of maximising their job resources and minimising their job demands. Their definition too, was framed based on the JD-R Model. Congruent with Wrzesniewski and Dutton's (2001) original conceptualisation, Slemp and Vella-Brodrick believed that job-crafting behaviour could manifest in three distinct forms, namely task-, relational, and cognitive. The aim of the authors, then, was to develop a scale that targeted all three types of job-crafting behaviours, which resulted in the development of the JCQ. The development and validation process of the JCQ are discussed below.

The development of the JCQ began with the construction of an initial item pool. Based on an extensive coverage of the job crafting literature and an analysis of existing job crafting scales, a preliminary set of 27 items was constructed. These 27 items were first administered to employees (n = 23) who were known to the researchers, for qualitative analysis, in which the authors sought feedback on the item content. Upon review of the item pool and subsequent deletion of potentially problematic items, a set of 21 items was retained, consisting of seven items per *Job crafting* dimension (i.e. *Task*, *Relational*, and *Cognitive*).

The 21 items were then administered to a working sample (n = 334) from the Australian population. Respondents were requested to indicate the extent to which they engaged in the various job-crafting behaviours on a frequency response format ranging from *1* (*Hardly ever*) to *6* (*Very often*). A series of avenues (i.e. social networking sites, online discussion forums, staff email, and company newsletters) was used to recruit the sample. Furthermore, an incentive (i.e. a chance to win an iPod) was used to entice participation. The data obtained were subjected to a statistical analyses that comprised of four steps. EFA, using maximum likelihood, was conducted in the first step, to assess the factor structure of the 21-item JCQ. The second step included CFA, which was performed to confirm the hypothesised three-factor structure. At this stage, mirroring Tims et al.'s (2012) validation study, the following

goodness-of-fit indices were explored to assess model fit: x2/df, CFI, IFI, RMSEA, and the non-normed fit index (NNFI). The third step involved assessing the internal consistency (i.e. reliability) of the JCQ by computing Cronbach's alpha. The fourth and final step was to assess the convergent validity of the JCQ.

The results obtained from the initial EFA showed that a three-factor solution best represented the data. This was evident in a scree plot that revealed a break after the third factor. In total, the three-factor solution explained 56% of the variance in the total score. At this stage, the authors applied a cut-off value of .40 for the factor loadings, resulting in two of the items from the *Cognitive job crafting* dimension being deleted (the items either cross-loaded or did not meet the minimum cut-off). Following this, another EFA was performed on the resulting 19-item JCQ, which, again, supported a three-factor structure (seven items representing the *Task-* and *Relational job crafting* dimensions respectively, and five items representing the *Cognitive job crafting* dimension).

Having examined the initial factorability of the JCQ, the data were submitted for CFA, to confirm whether the three-factor solution, indeed, best fit the data. Preliminary analysis of the 19-item scale indicated a model with poor fit ($\chi 2/df = 2.44$; CFI = .89; NNFI = .88; IFI = .89; RMSEA = .09). It was evident at this stage that four items were not performing as intended (i.e. they were either correlating with the wrong factor, or they correlated poorly with their respective latent variable). As a result, the four items were excluded, leaving a total of 15 items for further analysis (five items per *Job crafting* dimension). Another CFA was then performed on the final 15-item JCQ, whereby the proposed three-factor structure was compared to a one-factor structure. As anticipated, the results of the CFA indicated that the three-factor structure produced a more parsimonious model ($\chi 2/df = 1.71$; CFI =.96; NNFI = .95; IFI = .96; RMSEA = .06).

With regard to reliability, all three *Job crafting* dimensions performed well above the recommended .70 threshold proposed by Nunnally and Bernstein (1994). The following Cronbach alphas were reported: *Task crafting*: $\alpha = .87$; *Cognitive crafting*: $\alpha = .89$, *Relational crafting* ($\alpha = .83$), and total *Job crafting* ($\alpha = .91$).

The final step in assessing the validity of the JCQ was to test its convergent validity against theoretically-linked constructs such as organisational citizenship behaviour (OCB), strengths use, self-concordant behaviour, work contentment, and job satisfaction. As hypothesised, all

the correlations were significant, and, in their proposed directions, providing evidence for the convergent validity of the JCQ.

2.2.3.3 The Self-Undermining Scale

Bakker and Wang (2016) developed and validated the Self-Undermining Scale and proposed that it can be used to assess undesirable employee behaviours. The authors aimed to develop a scale that could measure dysfunctional behaviours that employees engage in that impair/hamper their own functioning and worsen their working conditions. The development and validation process of the Self-Undermining Scale spanned over two separate studies, which are discussed below.

Study 1

In the first study, the objective was to examine the factorial validity and reliability of the scale across a series of different samples. Ten items were originally formulated in Dutch, which were then translated and back-translated into various other languages (i.e. English, Romanian, Spanish, and Chinese). During the item-construction phase, experts (n = 10) were asked to critique the content of the items, and any items that were unclear were reformulated. The scale was first administered to a sample of employees from China, whereafter the factor structure was explored using varimax rotation. Thereafter, the factorial validity of the scale was cross-validated by administering the scale to the various other samples (i.e. Chile, Romania, Netherlands, and the USA). The response categories ranged from *1* (*Never*) to *5* (*Very Often*); in two of the samples (i.e. English and Chinese), however, the response categories ranged from *1* (*Never*) to *7* (*Always*).

Results of the EFA amongst the Chinese sample showed that a one-factor solution fit the data best and explained 59% of the total variance. All the items loaded well on the latent construct and produced factor loadings greater than .67. The scale also performed exceptionally well in terms of its internal consistency (α = .92). After the initial EFA was performed, the authors decided to remove four of the items from the scale, due to the scale being unnecessarily long (Bakker & Wang, 2016). They also pointed out that some of the items formed clusters that related to attribution and coping styles, rather than actual behaviours. The remaining six items were then subjected to another EFA, of which the one-factor solution explained additional variance in the total score (62%) and the item loadings were all above .76.

To further validate the factor structure among the remaining samples, a multi-group CFA was performed. Echoing the previous findings, an unconstrained one-factor model fit the data best. A mean factor loading of .61 was found across the four samples; however, there were cases in which the items functioned slightly different across the samples, indicating that the interpretation of the items varied slightly across the countries. The following alpha coefficients were reported: US: *a* =.87; Chile: *a* = .70; Romania: *a* = .79; and Netherlands: *a* = .73.

Study 2

In the second study, the Self-Undermining Scale, which now consisted of six items, was administered to two separate Chinese samples that comprised employees from the information technology (IT) and service-related industries. Aspects such as convergent, discriminant, and predictive validity were explored.

To test for convergent validity, it was hypothesised that *Self-undermining* would correlate positively with *Self-handicapping*, since these two constructs do have some conceptual overlap. In addition to this, the authors argued that, as self-undermining is a visible workplace behaviour, employees' supervisors should witness such behaviours, and, as a result, provide supervisor reports on their subordinates' self-undermining behaviour. It was thus hypothesised that self-reports of self-undermining would positively relate to supervisor reports of self-undermining. The findings of the study yielded support for both the above hypotheses, indicating that the scale has convergent validity.

In terms of discriminant validity, it was argued that *Self-undermining* would be weakly negatively related to constructs such as *Personal initiative* and *Job crafting*, since individuals who take personal initiative and craft their work seek opportunities to improve their performance, whereas self-underminers engage in behaviours that hamper their performance (Bakker & Wang, 2016). It was also hypothesised that, because self-undermining is associated with high job demands and burnout (Bakker, 2015), *Self-undermining* would be negatively related to *Work engagement*. Providing support for its discriminant validity, results showed that *Self-undermining* was indeed negatively related to *Personal initiative, Job crafting*, and *Work engagement*.

The final component to be assessed in showing the validity of the Self-Undermining Scale was its ability to predict an important criterion. Job performance was selected as the desired

criterion since the authors believed it contributed to the success and effectiveness of the organisation. Due to the fact that self-undermining behaviour impairs an individual's performance, it was hypothesised that it would be negatively related to job performance. This hypothesis was indeed supported, providing evidence for the predictive validity of the Self-Undermining Scale.

2.2.4 The Rasch Measurement Model

Rasch model applications can be used to evaluate the psychometric properties of existing ordinal scales (Tennant & Conaghan, 2007), and bring rigour to the social sciences through the creation of robust measurement instruments (Boone, Staver, & Yale, 2014). According to Hagquist, Bruce, and Gustavvson (2009), and as previously mentioned, the Rasch model allows one to detect important measurement issues that may not be easily detectable through traditional analyses (such as EFA and CFA), such as determining how effective a questionnaire and its items are at targeting a person's ability, determining the hierarchical ordering of an item set, an investigating how well a set of categories functioned in capturing the underlying construct of interest. Item Response Theory (IRT) methods, such as Rasch, are also useful in identifying, empirically whether an instrument discriminates better between individuals who are lower versus higher on a particular trait or behaviour being measured (Harvey & Hammer, 1999). Understanding of the Rasch measurement model as an analytic tool is still somewhat limited (Tennant & Conaghan, 2007), and, as such, a discussion of the model along with some of its key features will follow.

Take, for example, the following two items (*cf.* Boone et al., 2014):

	Strongly disagree	**Disagree**	**Do not agree/Disagree**	**Agree**	**Strongly agree**
1. I like to exercise	1	2	3	4	5
2. I like to play golf on Monday afternoons	1	2	3	4	5

What we know from the above response format is that the data are ordinal; an increase from *1* to *5* would indicate higher levels of agreeability for any of the two items. We also know that a *5* (*Strongly agree*) shows more agreeability than *4* (*Agree*). What we do not know, however,

is if the distance between each response option (1|2|3|4|5) is equal across the response format. That is, we assume that the distance between *1* (*Strongly disagree*) and *2* (*Disagree*) is equal to that between *4* (*Agree*) and *5* (*Strongly agree*). We also interpret a score of *5* on Item 1 to be the same as a score of *5* on Item 2. This approach is flawed, because, according to the Rasch model, the two items differ in their degree of difficulty or what is referred to as 'endorseability' (Bond & Fox, 2007; Rasch, 1960). For example, Item 1 ("I like to exercise") is a lot easier to endorse than is Item 2 ("I like to play golf on Monday afternoons"), because it is fairly straightforward, and it is easier to say you like to exercise than it is to say you like to play golf on a Monday afternoon (as, in actual fact, you prefer to play golf on the weekend). Therefore, a score of *5* on Items 1 and 2 respectively carry different weightings and should not be used to compute individual raw scores, due to the non-linear nature of the data.

As stated by Boone et al. (2014), the changes in response options are non-linear (non-equal intervals), and, thus, we cannot use them to compare (precisely) individuals along a single trait continuum, as this may lead to erroneous statistical conclusions. Through Rasch analysis, however, we can transform these raw ordinal data into objective, fundamental, additive measures (Linacre, 2016a), which will enable more accurate interpretations. These additive measures are referred to as 'logits' (log-odd units), which are the units of measurement used in Rasch analysis (Linacre, 2016a), and which are commonly represented along a single continuum or what is referred to as a 'logit scale.' The reason they are referred to as logits is because the raw ordinal data that we obtain from our instruments are subjected to logarithmic transformations by the mathematical Rasch model (Haquist et al., 2009; Tennant & Conaghan, 2007).

The Rasch model can be thought of as a member of the larger family of IRT models (Embretson, 1996; Fischer & Molenaar, 1994; Van der Linden & Hambleton, 1997). It is named after the famous Danish mathematician, Georg Rasch, who took a strong interest in psychological measurement in the early 1940s (Rasch, 1960). For a detailed discussion on the man behind the model, the reader is asked to consult the works of Wright (1998). The Rasch model can be regarded as a latent trait psychometric model that provides a mathematical framework that researchers can and should use to compare their data (Boone et al., 2014). The model provides a theoretical idealisation that data need to adhere to (Bond & Fox, 2007) in order to be considered productive for measurement. That is, we can use the Rasch model as an analytic tool to formally assess the quality (i.e. reliability and validity) of an instrument against

the mathematical measurement model, to determine whether constructive measurement has been achieved. The Rasch model is considered prescriptive in nature, because it prescribes an ideal to which one's data need to adhere. An important point to note here is that the data must fit the Rasch model, and not the other way around (Iramaneerat et al., 2008). When the observed data parallel closely with the Rasch model's expected scores, the data are said to fit the Rasch model or accord with Rasch model expectations (Van der Velde, Beaton, Hogg-Johnston, Hurwits, & Tennant, 2009).

2.2.4.1 Model specification and assumptions

There are various versions of the Rasch model available, such as the dichotomous and polytomous form. The dichotomous model, as the name implies, deals with forced choice questions (e.g., *Yes*/*No* or *True*/*False*), whereas the latter is an extension of the dichotomous form, and deals with items that have multiple response categories. For the purpose of the present study, the Rasch polytomous model was used, as the data had multiple response categories.

Two forms of the Rasch polytomous model exist, namely the partial credit model (Masters, 1982) and the Andrich rating scale model (Andrich, 1978). The Andrich rating scale model was chosen for the present study because it constrains the category thresholds to be equal across all items, and is therefore more restrictive in nature (Andrich, 1978; Bond & Fox, 2007). Fox and Jones (1998) state that the rating scale model is best suited to polytomous data that have the same response format across all items, which was the case in the present study. As with all mathematical and statistical models, the Andrich rating scale model has its own formula, which takes the following logistical form,

$$\ln\left(\frac{P_{nik}}{1-P_{nik}}\right)=\theta_n - b_i - \tau_k$$

where P is the probability of person n affirming category k in item i; θ is person ability, b is the item difficulty parameter, and τ_k is the difficulty of the k category.

As mathematically expressed above, Rasch (1960) proposed that a person's response to any given item is a function of his or her position on the latent trait and the difficulty of the item itself. In the case of polytomous data, the difficulty of the category is also added to the equation

(as shown above). This brings us to some of the few basic assumptions that underlie the Rasch rating scale model, namely (1) each person is characterised by an ability or what is referred to as a *person measure*, which can be described as a quantitative value of a person's trait, attitude, ability, or any particular feature along a unidimensional measurement scale (Boone et al., 2014); (2) each item is characterised by a degree of difficulty or endorseability, which is represented by the *item location* in the Rasch model; (3) each category threshold is characterised by a degree of difficulty or endorseability, and; (4) all of these can be numerically expressed along a single line of inquiry (continuum) (Bond & Fox, 2007).

The last assumption brings us to an important point — unidimensionality. Any discussion of the Rasch measurement model cannot be done without considering the Rasch prerequisite for unidimensional scaling. For any Rasch endeavour to be undertaken, it is imperative that the instrument being investigated is unidimensional (Iramaneerat et al., 2008). As Bond and Fox (2007) put forth, effective measurement with the Rasch model involves the assessment of a single human attribute at a time along an ordered (from lowest to highest) line of inquiry.

2.2.4.2 Key features of the Rasch Model

The Rasch model provides a number of key features that researchers can and should use to their advantage when designing or evaluating existing measurement instruments. As will be discussed below, the Rasch model allows one to determine, for example, how well a questionnaire does at separating the individuals and items, or how well the category response format functioned for a particular sample.

2.2.4.2.1 Wright map (construct map)

Item-person maps, or what are commonly referred to as *Wright Maps* (Wright, 1984), are generated in a Rasch analysis to depict the relationship between item difficulty and person ability (Bond & Fox, 2007). These Wright Maps (item–person maps) offer a useful and innovative technique for displaying complex rating scale data in a very simple manner (Boone et al., 2014). Figure 3, below, displays a Wright Map for a set of six items that use a five-point rating scale format. The items are labelled from *Item 1* (*I1*) to *Item 6* (*I6*) on the map. The spaces between the sets of items (marked *.2*, *.3*, *.4*, and *.5*) are the category thresholds (the intersection between two response categories).

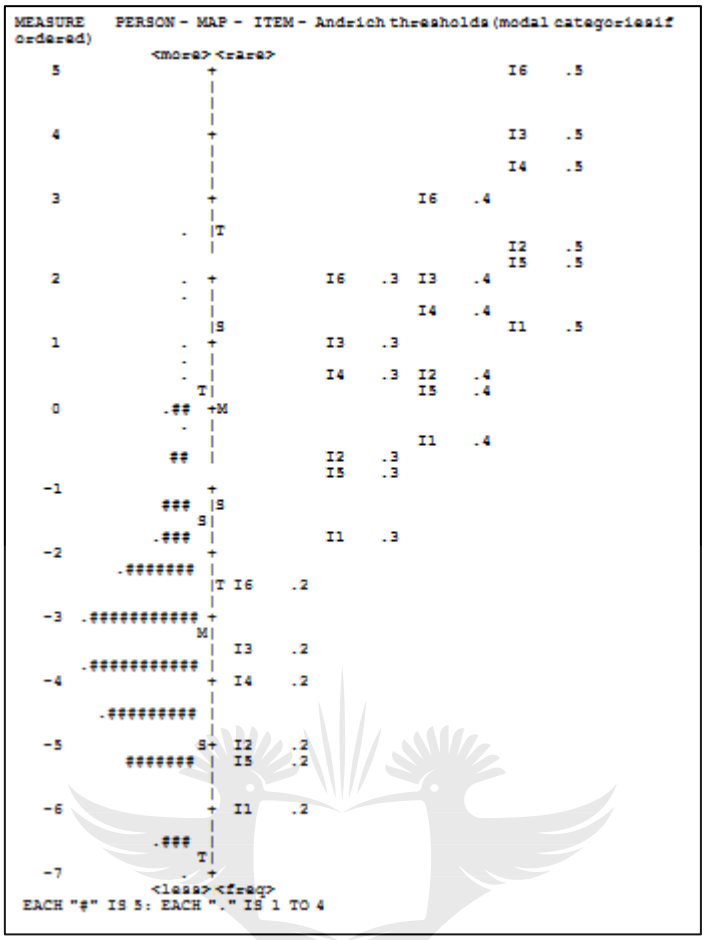

Figure 3. Wright Map for a six-item polytomous item set

The map is divided by a vertical line (i.e. the latent variable), with individual ability measures located in the left-hand column and item difficulty measures located in the right-hand column, with the most able persons and the most difficult items situated at the top (Linacre, 2016a). Through visual inspection of the map, it is possible to see the hierarchical ordering of both the persons and the items along a single continuum or logit scale. That is, we can determine who the most able persons were (those who had the highest levels of the construct being measured), as well as who the least able persons were (those who had the lowest levels of the construct being measured). It is also possible to see which items were the easiest or most difficult to endorse, and which items captured the highest/lowest levels of the construct being measured. The Wright Map also allows one to assess how well a particular set of items did at targeting the underlying construct. When the items are evenly spread along the construct, it is evident that they did well at tapping into various degrees of the construct being measured, whereas, if they are heavily clustered around a single location, the items are considered to be ineffective at targeting various degrees of the latent construct (Boone et al., 2014).

Wright Maps also provide useful information relating to the average (mean) person ability and the average (mean) item difficulty/endorseability. The means are represented with the letter *M* on the Wright Map. The mean item difficulty is situated on the right of the construct (i.e. vertical line), while the mean person ability is situated on the left of the construct. Through inspection of the item and person means, we can evaluate whether a questionnaire did well at targeting the ability of the respondents. When the mean person ability exceeds the mean item difficulty, the test is considered to have been too easy for the respondents; when the mean item difficulty exceeds the mean person ability, the test is considered to have been too difficult. Optimal scale targeting is achieved when the mean person ability and item difficulty are located close to one another on the Wright Map, usually close to zero (Boone et al., 2014).

2.2.4.2.2 Category functioning

According to Linacre (2002), rating scales such as Likert or frequency type scales can be used to gain more useful information from an item than would be extracted from a traditional dichotomous response. For example, take the following two items that are stated the same but contain different response formats: Item 1: "I exercise discretion over who I interact with while working" (*Yes/No*), and Item 2: "I exercise discretion over whom I interact with while working" (*Never/Hardly ever/Sometimes/Often/Very often*). As can be seen, the second item, which contains five categories, yields a lot more information than that provided by the first item with only two response categories. The information we obtain from the first item tells us whether or not an individual exercises discretion over whom they interact with while working. With Item 2, however, we are able to find out whether or not an individual exercises discretion over whom they interact with while working *and* how often they do so. That is, we can make use of response categories to elicit greater insights into the construct of interest. It is important, however, that the categories are ordered, well-defined, exhaustive, and context-specific, and that they capture both low and high levels of the construct (Wilson, 2005).

With Rasch model applications, it is possible to investigate how well a particular response format or rating scale functioned, using the diagnostic tools available to the researcher. This may include inspection of a number of indicators such as the category fit statistics, the category frequencies, the average category measures, and the step calibrations or category thresholds (Andrich, 1996; Bond & Fox, 2007; Linacre, 1995). The first indicator, namely fit statistics, brings us to a very important point. Rasch (1960) recommended that, in order to assess how

well an empirical data set met the Rasch model requirements, a set of chi-square fit statistics needs to be used. These fit statistics, which are applicable across persons, items, and categories, are generally presented as two chi-square ratios, namely the infit mean square and the outfit mean square statistic (Wright, 1984).

The infit mean square is an information-weighted fit statistic that is more sensitive to unexpected behaviour that affects responses to items that are well-matched to a person's ability (measure), whereas the outfit mean square is an outlier-sensitive statistic that is more sensitive to unexpected behaviour by persons on items that are far from an individual's ability (measure) (Curtis, 2004). Both the infit and outfit MNSQ are used to determine the compatibility of the data to the Rasch model (Bond & Fox, 2007). The Rasch model's expected score for the infit and outfit MNSQ were both 1. MNSQ values greater than 1 indicate underfit, and values less than 1 indicate overfit (Linacre, 2016a). MNSQ values between 0.5 and 1.5 are indicative of acceptable category fit, whereas values greater than 1.5 are problematic (Linacre, 2002, 2016a; Smith, 1996). These cut-off values were applied in the current research.

Category frequencies, on the other hand, are the number of occasions that a particular response category was chosen, and can also be used to rate the effectiveness of a particular category set. It is important to look at the category frequencies to determine whether each category is actually being used amongst the respondents. Categories with low frequencies are often redundant or do not provide enough information about the construct of interest (Bond & Fox, 2007). Linacre (1999, 2002) recommends a minimum of ten responses per category. In terms of the average category measures, which denote the average abilities of the respondents in each particular category (Linacre, 2016a), it is expected that the values would increase monotonically with each respective category. That is, the highest category should have the largest category measure, as it is expected that individuals who score high on the trait or construct will endorse the highest category available. If the category measures do not advance across the rating scale, there is evidence of category disordering. With regard to the category thresholds, which can be thought of as the 'boundaries' that separate each category from its adjacent category or the difficulty of selecting one category over another (Bond & Fox, 2007; Linacre, 2016a), it is also expected that the threshold values would increase monotonically across the rating scale (Linacre, 2002). Like the category measures, when the thresholds do not increase monotonically across the response options, they are considered disordered (Bond & Fox, 2007).

Category and threshold disordering can occur if, for example, there are too many categories for the respondent to discriminate; if the categories are not defined, or their descriptions are not properly ordered; or if a certain category only taps into a small amount of the construct being measured (Linacre, 2016a; Wilson, 2005). If, upon scrupulous investigation, it is evident that the response options are not functioning accordingly, one may decide to collapse the problematic categories to form better-functioning categories (Bond & Fox, 2007; Tennant & Conaghan, 2007). Hagquist et al. (2009), for example, conducted a study in which they applied the Rasch model to analyse the psychometric properties of a nursing self-efficacy (NSE) scale, which consisted of 11 response categories. Upon conducting a Rasch analysis, they found that there were indeed signs of category disordering, which prompted the researchers to collapse the 11 categories to form seven categories, resulting in improved instrument performance. Generally, collapsing of categories results in a better fit between the data and the Rasch model; however, it is possible to lose some statistical information in the process, which may impact negatively on aspects such as the person reliability (Linacre, 2016a); therefore, caution should be taken when considering collapsing categories.

A final feature of the Rasch model that is applicable to how effective a particular set of categories functioned is an inspection of the category probability curves. The category probability curves show how the response structure is predicted to work for future samples, provided that it worked satisfactorily for the sample under investigation (Linacre, 2016a). The probability curves, as the name implies, indicate the probability that an observed category will be selected. Upon inspection of the curves, it is required that the curves display what seems to be 'a range of hills' (Bond & Fox, 2007; Linacre, 2002). Figure 4, below, displays the desired structure of the category probability curves for a five-point response rating format.

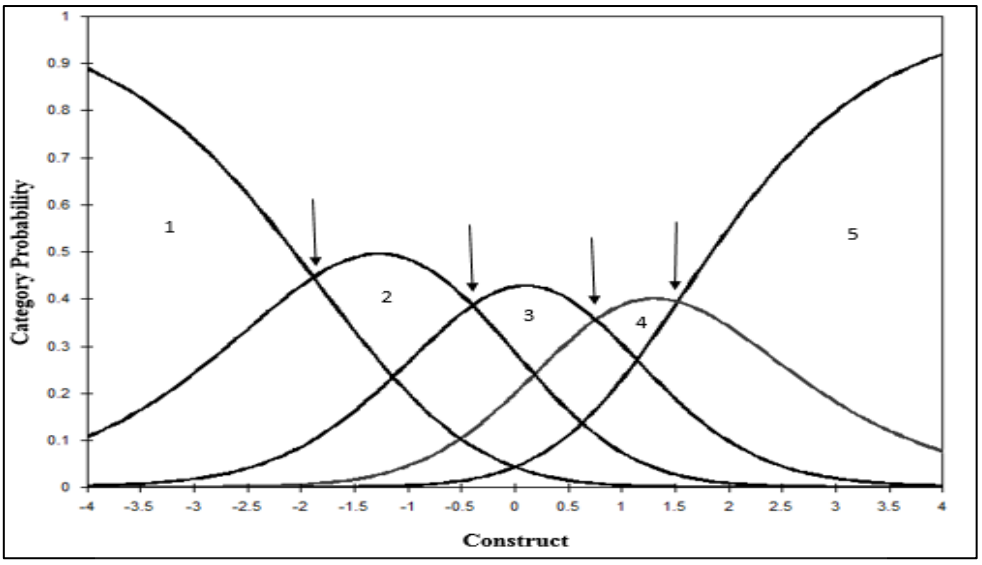

Figure 4. Category probability curves for a five-point response rating format

As can be seen in the above figure, the probability curves resemble a range of hills that extend across the latent variable or construct (x-axis), and the probability of observing each category is represented on the y-axis. The thresholds, which are the points of intersection between the categories (Linacre, 2016a), are indicated by the arrows (note that there are four thresholds for the five categories). When using the probability curves as a means to investigate category functioning, we look to see that each category has a distinct peak (Boone et al., 2014), which indicates that the category was most probable of being selected at some point along the measured construct (Bond & Fox, 2007). When the categories do not have distinct peaks, or they overlap/coincide with adjacent categories, it tells us that the categories did not provide much information over and above that provided by the adjacent category, and, therefore, we may consider collapsing the category. Lastly, another point worthy of observation in the above figure is that the highest category (i.e. Category 5) captured the highest levels of the construct, whereas Category 1 captured the lowest levels of the construct, which is a necessary requirement of the Rasch measurement model.

2.2.4.2.3 Item- and person fit

Construct validity, which refers to how well an instrument measures what it purports to measure, is probably the most sought-after goal in any scale construction process (Netemeyer, Bearden, & Sharma, 2003). In order to achieve construct validity, or to ensure that a questionnaire measures what it is intended to measure, it is paramount that it consists of well-performing items that tap into various degrees of the construct being measured (Bond & Fox,

2007). With Rasch analysis, we are able to determine how well a particular set of items performed at capturing the latent construct of interest through inspection of their distribution along the latent construct (i.e. the Wright Map). In addition to this, Rasch provides a set of summary and individual item-fit statistics that enable one to determine how well the observed data fit the theoretically derived Rasch model expectations (Tennant & Conaghan, 2007). These fit statistics serve as quality control mechanisms, and are designed to screen misfitting items or persons (Wang & Cheng, 2005).

The summary fit statistics summate all the items and persons, and provide an indication of the overall fit to the Rasch model. The fit of the data to the Rasch model is assessed, in part, by inspecting the infit and outfit MNSQ statistics for both the items and the persons who completed the questionnaire. As previously mentioned, the Rasch expected score for both infit and outfit is 1, which is indicative of perfect fit. However, Linacre (2016a) states that, because the Rasch model is a theoretical ideal, we can always expect some degree of misfit. A general guideline is that values greater than 1 suggest underfit (i.e. unexplained noise or other sources of variances in the data), and values less than 1 indicate overfit (i.e. the data are predicted too well by the model) (Linacre, 2016a).

The same approach is applied when investigating the fit for each particular item in a data set; each item has an associated infit and outfit MNSQ statistic that allows one to assess how well the item performed in accordance to Rasch model expectations. According to Bond and Fox (2007), any peculiar or unusual behaviour on any particular item will be flagged by the fit statistics. How does one know whether an item is misfitting? There is no definitive answer to what is considered good item fit, but researchers have recommended a lower-bound estimate of .75 and an upper-bound estimate of 1.33 for infit and outfit (Adams & Khoo, 1996; Wilson, 2005). Other researchers have argued that MNSQ values are sensitive to sample size, and a common critical range for detecting misfit is inappropriate (Smith, Schumacker, & Busch, 1995; Wang & Chen, 2005). Linacre (2016a) suggests parameter-level MNSQ statistics between .5 and 1.5. Given that the context of the present was the behavioural sciences, and that the proposed measurement instruments were used for research purposes and not clinical diagnosis, a desired cut-off range of .75 and 1.30 was applied in assessing item fit. That is, any items that produced MNSQ values lower or higher than the desired range were considered potentially problematic.

Another approach deemed useful in investigating item fit is visual inspection of the expected and empirical ICCs. The expected ICC, also known as the item response function (IRF), plots the individuals' expected score to an item given a certain amount of the latent trait/attribute/behaviour being measured, whereas the empirical ICC plots the actual or observed responses to the item (Linacre, 2016a). If the empirical (observed) item curve matches the expected (theoretical) curve, the item is considered to perform well and fit the Rasch model. Misfitting items, however, will present ICCs that deviate substantially from the theoretical curve, and that fall outside the 95% confidence interval bands.

When inspecting item fit, it is important to note that even the smallest account of unexpected responses by respondents can result in overinflated MNSQ values or poor-performing ICCs (Smith et al., 1995). For example, some individuals may provide extreme or unusual responses that may affect the fit of the items and create unnecessary noise in the data (Tennant & Conaghan, 2007). It is thus important to consider any misfitting persons prior to deleting any of the questionnaire's items. As with the item-fit statistics, a set of infit and outfit MNSQ statistics is produced for persons in a Rasch analysis, which would aid in identifying any problematic cases. Curtis (2004) recommends an acceptable (lenient) range of 0.5 and 1.6 for diagnosing person misfit.

2.2.4.2.4 Reliability and separation

The reliability of an instrument can be evaluated more thoroughly with the use of Rasch applications (Boone et al., 2014). When investigating reliability, there are two facets of measurement interest that need to be taken into consideration, namely the persons and the items. A person-reliability estimate and separation index describes how well the test will do at replicating the person ordering if the same respondents were to be given a similar set of items that measure the same construct (Wright & Masters). Linacre (2016a) notes that the person separation reliability is used to classify people, and is equivalent to the traditional test reliability or Cronbach's alpha. Low person separation (index < 2; person reliability < .80) suggests that the test does not do well at discriminating between high and low performers, and may be in need of more items (Linacre, 2016a). An item-reliability estimate and separation index indicates how well the sample did at estimating the hierarchical ordering of the items. High item reliability suggests that the ordering of items will remain consistent across similar samples of people, whereas low item reliability suggests that the sample was not sizeable enough to

determine the hierarchical ordering of the item difficulties (Bond & Fox, 2007; Linacre, 2016a).

2.2.4.2.5 Differential item functioning

The use of psychological measurement instruments and the interpretations thereof have serious implications, and, as such, it is important that the scores obtained from these tests are free from bias. An item is considered biased if it unfairly favours one group over another (Hidalgo, Galindo-Garre, & Gómez-Benito, 2015). One of the best ways to detect item bias is through DIF analysis (Furr & Bacharach, 2014), which allows one to determine whether an item works invariantly across two or more sub-groups.

An underlying assumption of the Rasch model is that person measures should be independent of any particular item used. Thus, DIF is said to exist if the item locations (i.e. difficulty estimates) vary across different samples or sub-groups (Bond & Fox, 2007; Hagquist et al., 2009). That is, one group (e.g., men) finds a particular item more difficult to endorse than another group (e.g., women). Tennant and Conaghan (2007) posit that it is important to identify item bias, as it may affect the overall fit of the data to the Rasch model. A useful approach to detecting item bias or DIF in a Rasch analysis is inspection of the ICCs for two sub-groups. If, for example, the item curves for men and women differ in their structure, then DIF is present (i.e. the two groups interpret the item differently). One may also pursue an investigation of the DIF contrasts and *t*-statistics for different sub-groups. Linacre (2016a) proposes that DIF contrasts need to be large enough (i.e. > .50 logits) and statistically significant ($t > 2.0$; $p < .05$) to be noticeable.

To allow for the easy transferability of the research findings, the present study sought to investigate DIF for two sub-groups, namely age and gender. Age and gender are common demographic features reported on in research studies, which can be easily investigated and compared across studies, both locally and internationally. Also, these two variables are often controlled for in studies when predicting important work outcomes, as they may have a direct influence on the dependent variable of interest (see Peeters & Demeouti, 2016; Petrou, Demerouti, & Schaufeli, 2016). Proponents of the Rasch model have stated that one should at least expect to see DIF for age and gender reported (Tennant & Conaghan, 2007).

Although little research has focused exclusively on gender and age differences in job-crafting behaviour, there have been some attempts. For example, Slemp and Vella-Brodrick (2014) conducted a study among 253 working adults, and found that women reported a statistically significant higher mean for relational crafting than men did. Petrou, Demerouti, and Schaufeli (2016), on the other hand, examined the role of job-crafting behaviours for successful organisational change, and controlled for both age and gender, since they believed that some employees may be more sensitive to adapting to change via job-crafting behaviours as a result of their age or gender. Another recent qualitative study investigated the effects of age on job-crafting behaviour and found that (1) younger and older employees are equally likely to craft their jobs, to exercise control over their job or to create a positive self-image (2); both younger and older employees engage most in task-crafting behaviour; and (3) younger employees may differ in their motivations to craft (El Baroudi & Khapova, 2017). Similar findings were reported in an unpublished Master's thesis that examined the different motives of younger and older workers in job-crafting behaviour (Van den Oetelaar, 2011). The study found that older employees engage more in cognitive forms of crafting, and older employees engage in task crafting to deal with their decreased physical abilities and to transfer their knowledge, while younger employees engage in task- and relational crafting to develop themselves.

As far as self-undermining is concerned, there have been no studies that examined age- and gender differences in self-undermining behaviour, which may be attributed to the infancy of self-undermining research. However, there have been studies that explored gender differences in self-handicapping behaviour, with results consistently showing that men engage more in self-handicapping than women do (see Hirt, McCrea, & Boris, 2003; Midley & Urdan, 1995). In terms of other workplace behaviours of interest, studies have shown that men are more engaged at work (Steyn & Grobler, 2016), are less likely to report turnover intentions (Huffman & Olson, 2017), and perform slightly worse than women (Roth, Purvis, & Bobko, 2012).

2.3 METHODOLOGY

2.3.1 Research Procedure

An online survey was created, which included a biographical information section and the three proposed workplace behaviour questionnaires. To avoid any missing data, a default function was set that made completion of each item compulsory. Once finalised, a link to the survey was available, which could be circulated via email to working individuals. In addition to this,

the link was placed on a number of social and professional networking platforms that could easily disseminate it to the public. Respondents were encouraged to 'share' the link with their colleagues and any other interested parties that may be willing to participate in the study. The link to the survey was accompanied by a short description of the study and the minimum requirements for participation. Upon clicking on the link, the respondents were presented with a preface to the questionnaire, which explained the purpose of the study and the anonymous, confidential, and voluntary nature of it. Recurring emails and posts were sent to remind respondents to participate. The data collection period ran for three consecutive months (January 2017 to March 2017), and the final data set was captured and stored in a secure location.

2.3.2 Respondents

In order to participate in the research, respondents had to be currently employed in the South African work context, be proficient in English, and be willing to participate. Using non-probability sampling, a final sample size of 318 individuals was obtained (57 % women, 43% men). In terms of marital status, most of the sample were either married (39%) or single (34%), and in terms of ethnicity, the majority identified themselves as white (74%). The mean age of the sample was 36 years, with an average organisational tenure of six years. Respondents represented a diverse range of industries, such as education, banking, IT, marketing, and business consulting. With regard to educational level, 37% of respondents held a matric or bachelor's degree, while 38% held a post-graduate qualification.

2.3.3 Measuring instruments

2.3.3.1 The JCQ

The JCQ (Slemp & Vella-Brodrick, 2013) consists of three dimensions: *Task crafting*, *Relational crafting*, and *Cognitive crafting*, and was used to assess job-crafting behaviour. The scale is made up of 15 items, and individuals are asked to rate the extent to which they engage in certain crafting behaviours on Likert-type scale ranging from *1* (*Hardly ever*) to *6* (*Very often*). An example item is: "I introduce new approaches to my work." In their validation study, Slemp and Vella-Brodrick (2013) reported the following Cronbach alpha coefficients: *Task crafting*: $\alpha = .87$, *Cognitive crafting*: $\alpha = .89$, and *Relational crafting*: $\alpha = .83$. The total Cronbach alpha for the JCQ was .91 (Slemp & Vella-Brodrick, 2013).

2.3.3.2 The JCS

The JCS (Tims, Bakker, & Derks, 2012) was the second scale used to measure job crafting behaviour. The 21-item scale measures four dimensions of job crafting, namely *Increasing structural job resources*, *Increasing social job resources*, *Increasing challenging job demands*, and *Decreasing hindering job demands*. Individuals are asked to rate how often they engage in the above-mentioned forms of job-crafting behaviour on a five-point frequency rating scale (*1 = Never*, *2 = Sometimes*, *3 = Regularly*, *4 = Often*, *5 = Very often*). An example item is: "I make sure I use my capacities to the fullest." Tims et al. (2012) reported the following Cronbach alpha coefficients in their validation study of the JCS: *Increasing social job resources*: α = .77, *Increasing structural job resources*: α = .82, *Increasing challenging job demands*: α = .75, and *Decreasing hindering job demands*: α = .79.

2.3.3.3 The Self-Undermining Scale

The Self-Undermining Scale of Bakker and Wang (2016, in press) was used to measure behavioural self-undermining. The scale consists of six items that measure a single latent construct. Individuals are asked to rate the extent to which they engage in self-undermining behaviour on a five-point frequency rating scale (*1 = Never*, *2 = Sometimes*, *3 = Regularly*, *4 = Often*, *5 = Very often*). An example item is: "I make mistakes." Bakker and Wang (2016) reported a total Cronbach alpha coefficient of .92 for the scale.

2.3.4 Statistical Analysis

A Rasch analysis was conducted using the WINSTEPS (Version 3.92.1.0) program (Linacre, 2016b). Due to the polytomous nature of the data, the Rasch-Andrich rating scale model was employed (Andrich, 1998). Separate analyses were conducted for each of the dimensions that made up the two job-crafting instruments. Aspects such as category functioning, item fit, reliability, and DIF were explored in the analysis.

Category functioning was assessed through inspection of the probability curves, category frequencies, category fit statistics (infit and outfit MNSQ), Andrich thresholds, and category measures. Category infit and outfit MNSQ statistics that were greater than 1.5 were considered problematic (Linacre, 2016a). Scale targeting was assessed through investigation of the item- and person locations along the latent construct (i.e. Wright Maps). If the mean person- and item location were close to zero, the instrument was considered to target the sample well. The

item locations (i.e. measures) were further explored to distinguish the hierarchical ordering of the items with regard to their endorseability/difficulty level. In terms of item fit, items were considered to accord with Rasch model expectations if their ICCs displayed the desired structure and fell within the 95% confidence-interval bands, and if their fit statistics were within the desirable range of .75 and 1.30 logits. The person (item) reliability estimates and separation indexes were used to report on the reliability of the instruments and sub-dimensions. Finally, item bias or DIF was investigated across two sub-groups, namely age and gender.

2.4 RESULTS

2.4.1 Self-Undermining Scale

2.4.1.1 Rating scale analysis

The Self-Undermining Scale consists of six items that are measured on a five-point frequency rating scale, where 1 = *Never*, 2 = *Sometimes*, 3 = *Regularly*, 4 = *Often*, and 5 = *Very often*. Visual inspection of the category probability curves showed that all five categories had distinct peaks, and therefore had the probability of being selected across the latent construct.

Table 2, below, provides the category frequencies, fit statistics, measures, and thresholds for the Self-Undermining Scale.

Table 2

Category Frequencies for the Self-Undermining Scale

Response category	Observed	%	Infit MNSQ	Outfit MNSQ	Andrich Threshold	Category Measure
1 (Never)	648	34	.96	.94	NONE	(-5.59)
2(Sometimes)	1016	54	.98	.82	-4.48	-2.25
3(Regularly)	164	9	1.11	1.12	.04	.59
4 (Often)	51	3	1.19	1.17	1.27	2.32
5 (Very often)	11	1	1.34	1.24	3.17	(4.37)

Table 2 reports the category functioning after three problematic individuals, who showed excessive misfit, were removed. The inclusion of these problematic individuals caused category misfit.

As can be seen from the table above, more than 80% of responses were captured by Categories 1 and 2. Categories 3, 4, and 5, on the other hand, captured substantially less responses (13% of the total responses), with Category 5 capturing the least, where only 1% of the total sample selected this option.

With regard to category fit, the infit MNSQ ranged from .96 to 1.34, and the outfit MNSQ ranged from .82 to 1.24, indicating acceptable fit for each category. Worthy of observation, however, is the slight underfit of Category 5, with an infit MNSQ of 1.34. This is slightly higher than what is desired (i.e. < 1.30), but nothing to be overly concerned about. The low frequency count (1%) for Category 5 could have been a result of the slight underfit. Also, Linacre (2016a) states that values greater than 1.5 for infit are problematic, which, in this case, it was not. Lastly, looking at the Andrich thresholds and category measures, the categories were properly ordered; each subsequent increase in category selection was accompanied by an increase in the category measure and threshold.

The above observations are further corroborated in Figure 5, below, which displays a Wright Map for the *Self-undermining* construct, which ranged from low (-7 logits) to high (5 logits). Looking at the Andrich thresholds (the vertical spaces between the items), we notice that, with each increase in category selection for each item, there was an increase in the level of the construct being measured. That is, the higher a person scored on *Self-undermining*, the more probable it was that the person would select a higher category (i.e. 4 or 5). It is, however, noticeable that there was some overlap between the categories. Category 3 (*Regularly*, which is between the 2nd and 3rd threshold) seems to have captured most of the information that was provided by Category 4 (*Often*). The same applies for Categories 4 and 5, with Category 4 (which is between the 3rd and 4th threshold) capturing most of the information provided by Category 5. Despite the overlap between categories, each category did indeed provide some unique information over and above its adjacent category. Figure 5 also displays the average measures (means) for both persons and items (represented by the letter *M* on the continuum). The mean item difficulty exceeded the mean person ability by almost three logits. This implies that the Self-Undermining Scale was a rather difficult test for this sample, and that the test did not do well at measuring those individuals who scored high on *Self-undermining*.

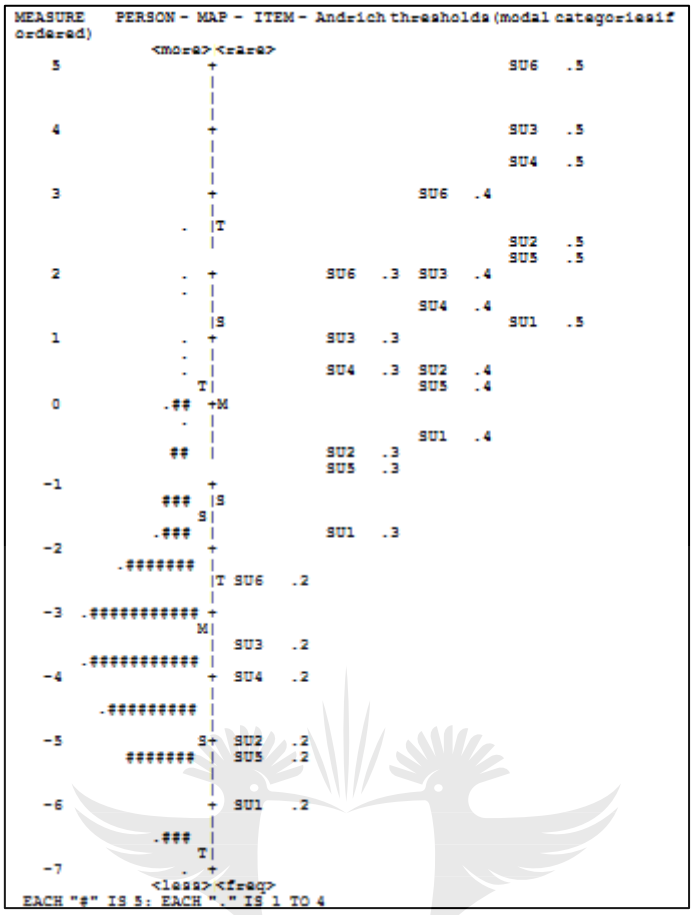

Figure 5. Category thresholds and item/person locations along the self-undermining construct

2.4.1.2 Item statistics

After an investigation of the category functioning, the six items comprising the Self-Undermining Scale were scrutinised. Initial investigation began by looking at the ICCs, to see whether any items displayed any unusual behaviour. Item SU1 seemed to be the only item that displayed slight misfit. The ICC for SU1 showed that individuals who scored low on *Self-undermining* were scoring higher than expected, whereas individuals who scored high on *Self-undermining* were scoring lower than expected. It was decided to divide the sample into three groups (high, medium, and low performers) to see whether SU1 was indeed functioning differently across groups. Upon observation, Item SU1 produced a statistically significant (p = .000) DIF contrast of 1.11 between Groups 1 and 2, and a statistically significant (p = .0001) DIF contrast of 1.48 between Groups 1 and 3, indicating that the item does indeed function differently for low, medium, and high self-underminers. The slight misfit of Item SU1 was noted, and caution was taken in further analyses.

After inspection of the ICCs, the summary fit statistics were explored. The mean infit and outfit MNSQ for persons were .97 (standard deviation (SD) = .72) and .95 (SD = .78) respectively. In terms of the items, the mean infit and outfit MNSQ were 1.04 (SD = .14) and .95 (SD = .18) respectively. Table 3, below, contains the item locations, standard errors, and fit statistics for each of the items.

Table 3

Summary Item Fit Statistics: Self-Undermining Scale

			INFIT		**OUTFIT**	
Item	Measure	SE	MNSQ	*t*	MNSQ	*t*
SU6	1.94	.14	1.01	.2	.85	-1.0
SU3	.92	.12	.94	-.7	.84	-1.6
SU4	.53	.12	1.24	2.7	1.21	2.1
SU5	-.79	.11	.97	-.3	.90	-1.1
SU2	-.80	.11	1.23	2.3	1.18	1.9
SU1	-1.81	.10	.86	-1.5	.74	-2.9
SD	1.25	.01	.14	1.6	.18	1.8

Note. Items appear in descending order from most difficult to endorse to easiest to endorse

Table 3 shows that SU6 was the most difficult item to endorse (δ = 1.94), whereas SU1 was the easiest (δ = -1.81). In terms of item fit, the infit MNSQ ranged from .86 to 1.24, and the outfit MNSQ ranged from .74 to 1.21. Applying the criteria where desired fit ranges between .75 and 1.3 logits, the only potentially misfitting item was SU1 with an outfit MNSQ of .74. Item SU1 was previously flagged for misfit, and the fit statistics confirmed its slight overfit. However, this misfit was so trivial that it did not cause concern. In fact, a cross-plot was conducted for person measures for two separate data sets, whereby the first data set included all the items and the second data set excluded the misfitting item (i.e. SU1). Results showed that the person measures did not differ between the two data sets, and, therefore, excluding item SU1 made no difference, and was therefore retained.

2.4.1.3 Reliability and separation statistics

The person reliability for the Self-Undermining Scale was .71, with a separation index of 1.57. The item reliability was .99, with a separation index of 10.26. The internal consistency (Cronbach alpha) for the scale was .77.

2.4.1.4 DIF

To ascertain whether the Self-Undermining Scale worked invariantly across groups, DIF was explored across two categories, namely age and gender. For age, respondents were classified into two age groups (older than 20 but younger than 40, and 40 years and older). DIF contrasts (values > .50) and significance values ($p < .05$) were inspected for indications of DIF.

After conducting the DIF analysis for age, it was found that no DIF existed between age groups. This was evident in that all DIF contrasts were smaller than .50, and none of the Rasch-Welsh probability coefficients were statistically significant. For gender, however, SU3 was the only item that appeared to be biased or show DIF. SU3 produced a statistically significant ($p < .05$) DIF contrast of .71 between men and women. The DIF measure for men and women was 1.33 and .61 respectively, suggesting that men found item SU3 more difficult to endorse than women did. Figure 6, below, depicts the DIF between genders across the six self-undermining items. Although it may seem that DIF existed for SU2 as well, the DIF contrast was not statistically significant.

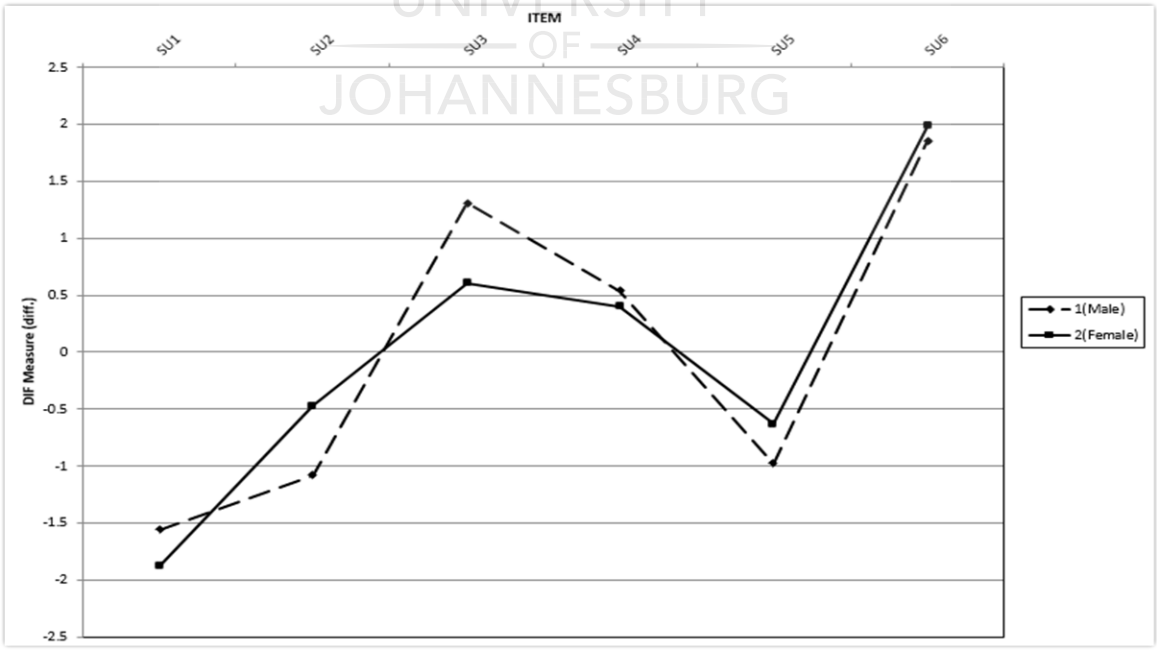

Figure 6. Differential item functioning according to gender (Self-Undermining Scale)

2.4.2 JCQ

Slemp and Vella-Brodrick's (2013) JCQ consists of 15 items that measure three job crafting dimensions, namely *Task crafting*, *Relational crafting*, and *Cognitive crafting*. Separate analyses were conducted for each of the three *Job crafting* dimensions.

2.4.2.1 Task crafting

2.4.2.1.1 Rating scale analysis

The *Task crafting* dimension consists of five items that are rated on a six-point frequency rating scale, where 1 = *Hardly ever* and 6 = *Very often*. Visual inspection of the category probability curves showed distinct peaks for each category and four thresholds, suggesting that each category was most probable at some point along the continuum. Also evident was that low *Task crafting* behaviour was best captured by Category *1* (*Hardly ever*), and high *Task crafting* was best captured by Category 6 (*Very often*). Category 2 appeared flatter in structure than the other categories, and seemed to coincide (slightly) with Categories 1 and 3. The category frequencies, fit statistics, measures, and thresholds are provided in Table 4.

Table 4

Category Frequencies for Task Crafting

Response category	**Observed**	**%**	**Infit MNSQ**	**Outfit MNSQ**	**Andrich Threshold**	**Category Measure**
1 (Hardly ever)	43	3	1.09	1.19	NONE	(-3.24)
2	97	6	.97	.99	-1.85	-1.75
3	244	15	.87	.94	-1.22	-.70
4	440	28	.83	.87	-.30	.36
5	487	31	.85	.90	.85	1.80
6 (Very often)	279	18	1.29	1.17	2.53	(3.75)

Table 4 shows that Categories 1 and 2 were less frequently used than their counterparts, and that the majority (77%) of responses were captured by Categories 4, 5, and 6. There was acceptable category fit, with an infit MNSQ ranging from .83 to 1.29 and an outfit MNSQ

ranging from .87 to 1.19. The Andrich thresholds were well-ordered, and the category measures increased sequentially with each increase in response category.

Figure 7, below, displays the Wright Map of the *Task crafting* dimension. As can be seen, the dimension is represented along a single construct line ranging from low (-4 logits) to high (+5 logits). The categories appear to capture most of the *Task crafting* dimension, with each step-like increase in category selection resulting in higher levels of the construct being measured. There seems to be some redundancy with regard to Categories 2 and 3, but this was very slight. Some items (i.e. JCQ4 and JCQ5) in Category 3 (between the 2nd and 3rd threshold) yielded the same information as JCQ1, JCQ2, and JCQ3 if Category 2 were to be selected for these items. There also appears to have been some information (between 1.5 and 2 logits) that was not captured by the *Task crafting* items. With regard to the means, the mean person ability was slightly higher than the mean item difficulty, suggesting that the sample found the items relatively easy to endorse.

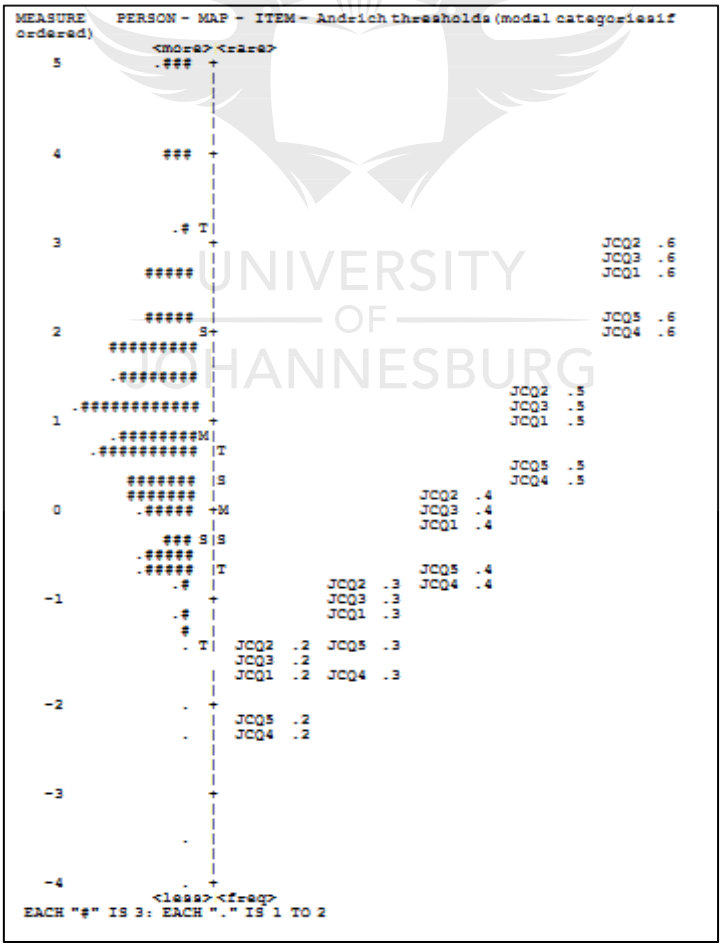

Figure 7. Category thresholds and item/person locations along the *Task crafting* dimension

2.4.2.1.2 Item statistics

To investigate item fit, an initial observation of the ICCs was conducted. All the items, except for JCQ5, adhered to Rasch model curve expectations. That is, the empirical curve for each item followed its expected (theoretical) curve. JCQ5, however, appeared to be erratic in its behaviour, with individuals scoring low on the trait scoring higher values than expected, and individuals scoring high on the trait scoring lower than expected. This was further verified by cross-plotting the item measures across three different groups (low, medium, and high performers), to see if any of the items functioned differently. JCQ5 was the only item that showed variance between the groups. It produced a statitsically significant DIF contrast ranging from .69 (p = .0003) to .95 (p = .02) between the three groups. Inspection of the total-sum correlations for each item also showed JCQ5 to be problematic; there was a large deviation between its expected and observed total-sum correlation. The misfit of JCQ5 was noted, and caution was taken in subsequent analyses.

Thereafter, the summary fit statistics were explored for the total five-item scale. The mean infit and outfit MNSQ for persons were .97 (SD = .97) and 1.00 (SD = 1.01) respectively. With regard to item fit, the mean infit and outfit MNSQ for items were 1.01 (SD = .36) and 1.00 (SD = .36) respectively. Table 5, below, contains the item locations, standard errors, and fit statistics for each of the *Task crafting* items.

Table 5

Summary Item Fit Statistics: Task Crafting

			INFIT		**OUTFIT**	
Item	Measure	SE	MNSQ	*t*	MNSQ	*t*
JCQ2	.42	.06	.69	-4.3	.67	-4.6
JCQ3	.30	.06	.80	-2.7	.79	-2.8
JCQ1	.13	.07	.68	-4.5	.69	-4.3
JCQ5	-.33	.07	1.55	5.7	1.58	6.0
JCQ4	-.51	.07	1.31	3.4	1.25	2.8
SD	.36	.00	.36	4.2	.36	.42

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse

Table 5 shows that JCQ2 had the highest item location (δ = .42) and JCQ4 had the lowest

(δ = -.51), meaning that Item 2 was the most difficult item to endorse, whereas Item 4 was the easiest. The infit MNSQ ranged from .68 to 1.55, and the outfit MNSQ ranged from .67 to 1.58. Although they appear to show slight misfit in terms of the desired fit range set for this study (.75 to 1.30), JCQ1, JCQ2, and JCQ4 were within the acceptable fit range of .50 and 1.50, as recommended by Linacre (2016a). JCQ5, however, displayed excessive underfit, with an infit and outfit MNSQ of 1.55 and 1.58 respectively. It was then decided to cross-plot the person measures across two different data sets, where the first data set included JCQ5 and the second data set excluded it. Cross-plots showed that person measures remained the same across the two data sets, and the inclusion of JCQ5 made no difference in terms of measurement[1].

2.4.2.1.3 Reliability and separation statistics

The person reliability was .75, with a separation index of 1.75. The item reliability was .96, with a separation index of 4.83. The Cronbach alpha for the *Task crafting* dimension was .78.

2.4.2.1.4 DIF

DIF was explored across two categories, age and gender[2]. Individuals were grouped into two age groups, those older than 20 but younger than 40, and those who were 40 years and older. DIF was considered to exist if there were DIF contrasts larger than .50 and significant Rasch-Welch t-values ($p < .05$).

JCQ5 appeared to be the only item that displayed signs of bias across the two age categories, with a statistically but not practically significant ($p = .04$) DIF contrast of .31 between the two groups. Group 1 had a DIF measure of -.44 while Group 2 had a DIF measure of -.13, suggesting that the younger group (Group 1) found JCQ5 easier to endorse than the older group (Group 2) did. Figure 8, below, shows the statistically significant DIF for JCQ5 between age groups. JCQ4 showed DIF, but it was not statistically significant. With regard to age, no DIF existed between men and women for the *Task crafting* dimension. This was evident in that none of the DIF contrasts were statistically across all the items.

[1] Upon the removal of JCQ5, the person and item reliability, as well as their separation indexes, increased for the *Task crafting* dimension.

[2] DIF analysis was conducted on the complete five-item Task Crafting Scale.

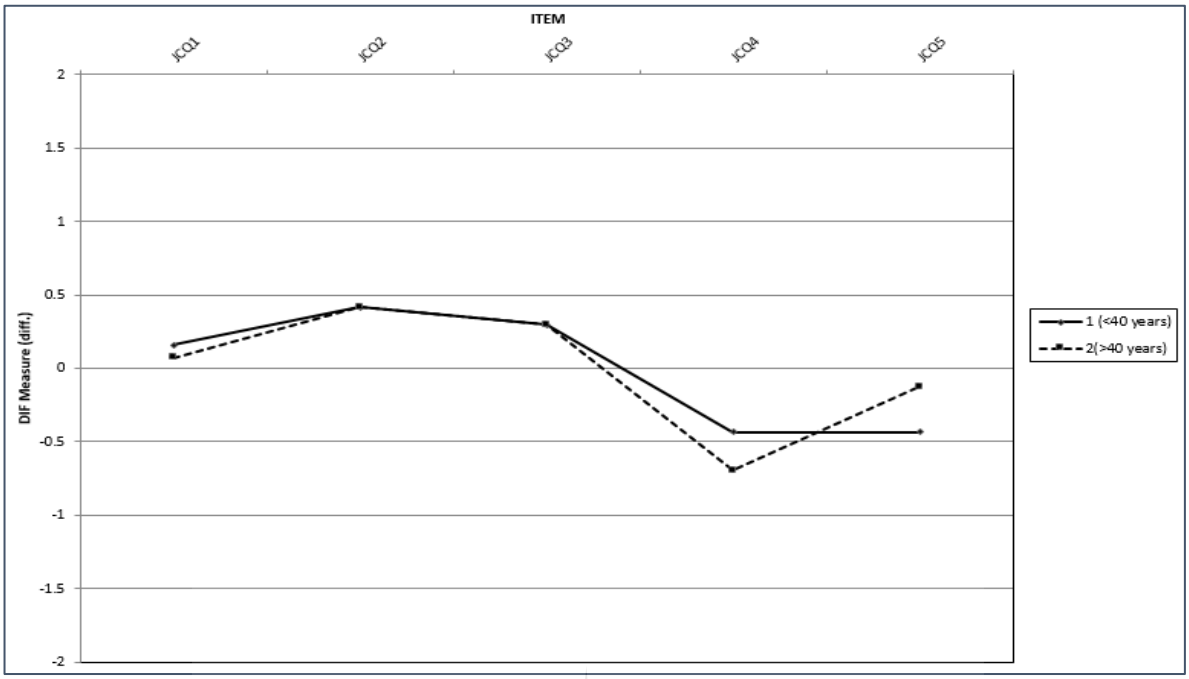

Figure 8. Differential item functioning according to age (*Task crafting*)

2.4.2.2 Cognitive crafting

2.4.2.2.1 Rating scale analysis

The *Cognitive crafting* dimension consists of five items, measured on a six-point frequency rating scale where *1 = Hardly ever* and *6 = Very often*. The category probaility curves showed distinct peaks and clear thresholds within and between each category respectively. That is, each category was most probable of being selected across the *Cognitive crafting* dimension. Visual inspection showed that high levels of *Cognitive crafting* behaviour was captured by the highest categories, and vice versa. Table 6, below, contains the frequencies, fit statistics, Andrich thresholds, and category measures for each category.

Table 6

Category Frequencies for Cognitive Crafting

Response category	Observed	%	Infit MNSQ	Outfit MNSQ	Andrich Threshold	Category Measure
1 (Hardly ever)	46	3	1.38	1.39	NONE	(-3.28)
2	116	7	1.04	1.10	-1.96	-1.65
3	224	14	.74	.71	-.97	-.55
4	313	20	.84	.87	-.02	.41
5	455	29	.87	.93	.65	1.65
6 (Very often)	436	27	1.24	1.15	2.31	(3.53)

Table 6 shows that Categories 1, 2, and 3 were the least chosen categories, with a frequency count of less than 25% across total responses. Categories 4, 5, and 6, on the other hand, captured more than 75% of the total responses, and were the most frequently used categories. The infit MNSQ ranged from .74 to 1.38, and the outfit MNSQ ranged from .71 to 1.39. Categories 1 and 3 showed some misfit, with Category 1 showing underfit and Category 3 showing slight overfit. The misfit of Category 1 may be attributable to its low usage frequency. Linacre (2016a), however, states that misfit values greater than 1.5 for categories are problematic, which, in the present study, it was not, and was not cause for concern. Looking at the Andrich thresholds and category measures, there was proper ordering; the values ascended from lowest to highest with each increase in category selection.

Figure 9 presents a Wright Map of the *Cognitive crafting* dimension. The persons' abilities (situated on the left of the continuum) are well matched to the item difficulties (situated on the right of the continuum) across the six categories (five thresholds). It is evident that high *Cogntive crafting* behaviour was best captured by the upper-most categories, and vice versa. There were a few individuals (situated at the top end of the continuum) who were not well targeted by the items and their categories; for these individuals, the test was too easy. Likewise, there were no individuals located at the lower end of the continnum whose ability would have best been captured by Categories 1 and 2. With regard to the mean person ability and the mean item difficulty, the mean person ability exceeded the mean item difficulty, suggesting that the items were fairly easy for the respondents to endorse. It is also noteworthy that there was some

information of *Cognitive crafting* behaviour that was not well targeted/captured by the categories, evident in the blank area between 1 and 2 logits.

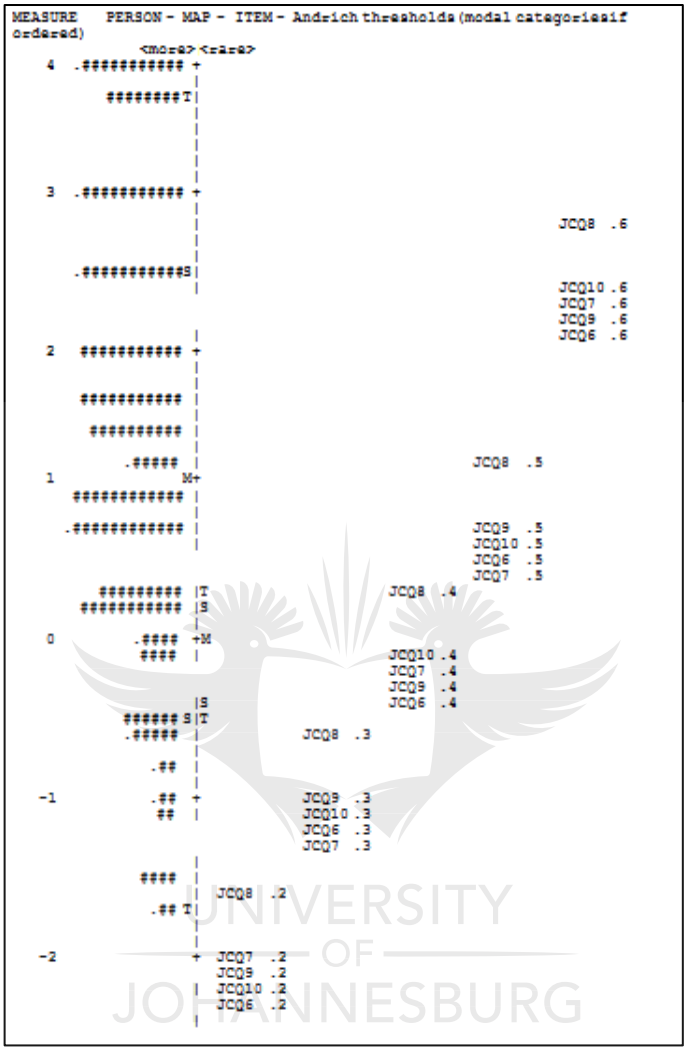

Figure 9. Category thresholds and item/person locations for *Cognitive crafting*

2.4.2.2.2 Item statistics

To obtain a birds-eye view of how the items performed in accordance with Rasch model expectations, an initial observation of the expected score ICCs was conducted. Visual inspection showed that all the items performed well, with their expected (theoretical) curves aligning closely with their observed (empirical) curves. The summary fit statistics for the *Cognitive crafting* dimension was then explored. The mean infit and outfit MNSQ for persons were 1.00 (SD = .93) and .99 (SD = .91) respectively. At item level, the mean infit and outfit

MNSQ were .99 (SD = .17) and .99 (SD = .18) respectively. Table 7, below, contains the item locations, standard errors, and fit statistics for each of the *Cognitive crafting* items.

Table 7

Summary Item Fit Statistics: Cognitive Crafting

			INFIT		OUTFIT	
Item	Measure	SE	MNSQ	*t*	MNSQ	*t*
JCQ8	.43	.07	1.17	2.0	1.20	2.4
JCQ9	-.04	.07	.75	-3.2	.72	-3.6
JCQ7	-.09	.07	.87	-1.6	.89	-1.3
JCQ10	-.10	.07	.97	-.3	.98	-.3
JCQ6	-.19	.07	1.20	2.2	1.16	1.8
SD	.22	.00	.17	2.1	.18	2.2

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse

Table 7 shows that JCQ8 had the highest item location (δ = .43) and was the most difficult item to endorse, whereas JCQ6 had the lowest item location (δ = -.19) and was the easiest to endorse. The items showed acceptable fit, with an infit MNSQ ranging from .75 to 1.20 and an outfit MNSQ ranging from .72 to 1.20. JCQ9 was the only item that displayed slight overfit, with an outfit MNSQ of .72. We should not be overly concerned about this, because outfit is mostly sensitive to unexpected scores that are far from the person's measure, and, according to Linacre (2016a), fit values between .5 and 1.5 are productive for measurement.

4.2.2.3 *Reliability and separation statistics*

For *Cognitive crafting*, the person reliability was .77, with a person separation index of 1.84. The item reliability estimate was .90, with an item separation index of 2.94. Cronbach's alpha was .85.

4.2.2.4 *DIF*

For the *Cognitive crafting* dimension, the results indicated that there were no signs of DIF between the age groups. This deduction was based on the fact that there were no large DIF contrasts between the age groups (the largest difference in item locations was .17 logits), and all the comparisons were non-significant. It can therefore be said that the individuals younger

than 40 years of age and the individuals older than 40 years of age interpreted the items in the same manner.

With regard to gender, however, Item 6 (JCQ6) and, especially, Item 7 (JCQ7) appeared to show bias between genders. Item 6 (JCQ6) produced a statistically significant DIF contrast of .33 (p = .0176), where men and women scored a DIF measure of .00 and -.34 respectively. That is, men experienced this item to be more difficult to endorse than women did. In terms of practical significance, the DIF contrast was less than .50, and, therefore, we were not concerned. Item 7 (JCQ7) produced a statistically and practically significant DIF contrast of .51 (p = .0003), where men and women scored a DIF measure of -.40 and .12 respectively. In this case, women found this item more difficult to endorse than men did. Given the practical significance of this item, it can be said that Item 7 (JCQ7) should not be used to differentiate between genders. Figure 10 depicts the large DIF between the genders.

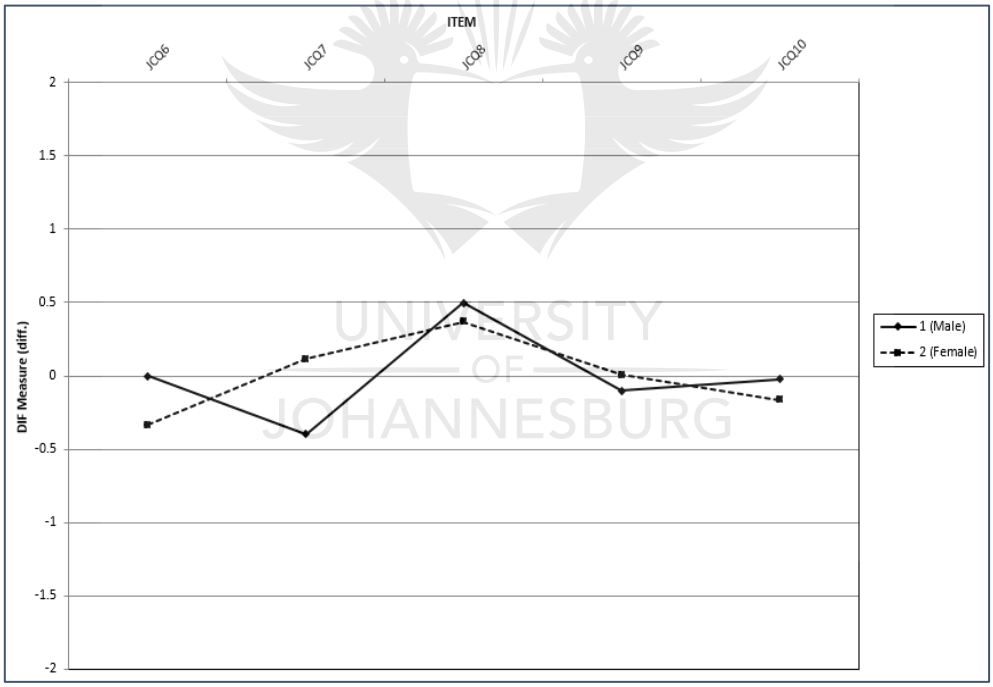

Figure 10. Differential item functioning according to gender (JCQ — *Cognitive Crafting*)

2.4.2.3 Relational crafting

2.4.2.3.1 Rating scale analysis

The final dimension explored was *Relational crafting*, which consists of five items. Responses are rated on a six-point frequency scale, where *1 = Hardly ever* and *6 = Very often*. Visual inspection of the category probability curves showed that all categories had distinct peaks and

were most probable at some point across the responses. Categories 2 and 3 appeared somewhat flatter in structure than their counterparts. Furthermore, Category 3, although showing a distinct peak, captured very little of the underlying construct, and almost fully coincided with its adjacent categories. Based on initial observation, there seemed to be no need to collapse any categories. Table 8, below, contains the frequencies, fit statistics, Andrich thresholds, and category measures for each category.

Table 8

Category Frequencies for Relational Crafting

Response category	**Observed**	**%**	**Infit MNSQ**	**Outfit MNSQ**	**Andrich Threshold**	**Category Measure**
1 (Hardly ever)	130	8	1.11	1.13	NONE	(-2.57)
2	161	10	.93	.93	-1.13	-1.26
3	218	14	.84	.78	-.67	-.48
4	362	23	.95	.98	-.38	.25
5	400	25	1.01	1.03	.56	1.28
6 (Very often)	319	20	1.12	1.07	1.62	(2.93)

Table 8 shows that Categories 1, 2, and 3 were the least-used categories, whereas Categories 4, 5, and 6 were the most frequently used, and captured more than 65% of the total responses. The categories presented satisfactory fit, with an infit MNSQ ranging from .84 to 1.12 and an outfit MNSQ ranging from .78 to 1.13. The Andrich thresholds and category measures showed good ordering, increasing progressively with each category.

Figure 11, below, displays a Wright Map for the relational crafting construct. The construct (represented by the vertical line) ranges from -3 to +4 logits. It is evident that both individuals and the items covered the broad spectrum of the construct. We also notice that an increase in *Relational crafting* behaviour would result in a higher category being selected, which is what is required by the Rasch model. With regard to the means, the mean person ability and item difficulty were located within close proximity to one another, suggesting that the test, in general, did well at targeting the individuals' relational crafting behaviour.

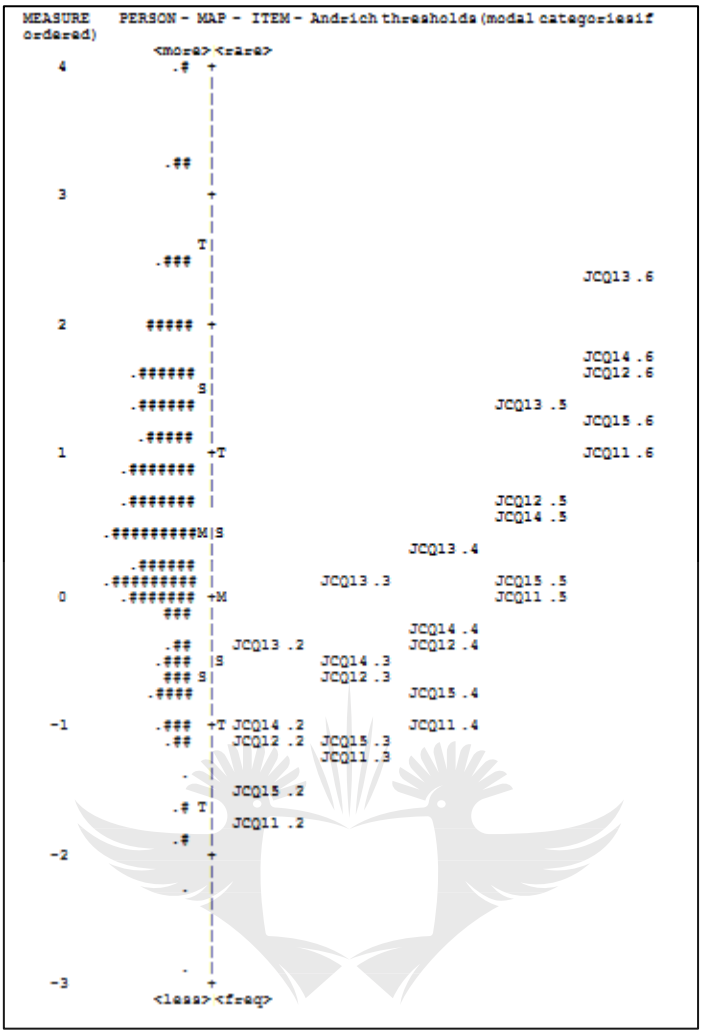

Figure 11. Category thresholds and item/person locations along the *Relational crafting* dimension

2.4.2.3.2 Item statistics

The first step in analysing the item fit was inspection of the ICCs. All the items, with the exception of JCQ14, adhered to Rasch model curve expectations. That is, the expected scores and the observed scores were closely aligned for each item. JCQ14, however, was somewhat erratic in its behaviour, with individuals scoring low on *Relational crafting* scoring higher than expected, and individuals high on *Relational crafting* scoring lower than expected. Furthermore, the empirical curve for JCQ14 fell just outside the 95% confidence interval, suggesting item misfit. A cross-plot of the items was then created, to determine whether JCQ14 was indeed functioning differently for low and high performers. JCQ14 produced a statistically significant (p = .0005) DIF contrast of .38, with Group 1 (low performers) scoring a DIF measure of -.07, and Group 2 (high performers) scoring a DIF measure of .31. That is, individuals with high levels of *Relational crafting* found JCQ14 more difficult than those with

lower levels of relational crafting. Although JCQ14 produced a statistically significant DIF contrast, it was not sizeable enough to be considered practically significant, and, therefore, we were not concerned. However, the misfit of JCQ14 was noted, and caution was taken in further analyses.

In terms of summary fit statistics, the mean infit and outfit MNSQ for persons were 1.01 (SD = .78) and 1.00 (SD = .75) respectively. The mean infit and outfit MNSQ for items were 1.00 (SD = .17) and 1.00 (SD = .19) respectively. Table 9, below, contains the item locations, standard errors, and fit statistics for each of the *Relational crafting* items. Results showed that JCQ13 was the most difficult item to endorse (δ = .79), and JCQ11 was the easiest to endorse (δ = -.58). The infit MNSQ ranged from .84 to 1.32, and the outfit MNSQ ranged from .84 to 1.37. In comparison to the other items, JCQ14 appeared to show misfit, with an infit and outfit MNSQ of 1.32 and 1.37 respectively. This confirmed previous observations regarding the misfit of this item. The fit statistics for JCQ14, however, were not highly problematic, as they still fell within the acceptable 'productive for measurement' range proposed by Linacre (2016a).

Table 9

Summary Item Fit Statistics: Relational Crafting

			INFIT		**OUTFIT**	
Item	Measure	SE	MNSQ	t	MNSQ	t
JCQ13	.79	.05	.95	-.6	.92	-1.0
JCQ14	.12	.06	1.32	3.7	1.37	4.0
JCQ12	.06	.06	1.02	.3	.99	-.1
JCQ15	-.39	.06	.86	-1.7	.84	-2.0
JCQ11	-.58	.06	.84	-2.0	.86	-1.6
SD	.48	.00	.17	2.1	.19	2.2

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse

To scrutinise JCQ14 even further, it was decided to cross-plot person measures across two different data sets. The first data set included JCQ14, and the second data set excluded it. Cross-plots showed that person measures did not differ across the two data sets, and that the

inclusion or exlusion of JCQ14 made no difference. It is, however, recommended that caution be taken with JCQ14 in future administrations[3].

2.4.2.3.3 Reliability and separation statistics

For the *Relational crafting* dimension, the person reliability was .74, with a person separation index of 1.68. The item reliability was .98, with an item separation index of 7.97. Cronbach's alpha was .78.

2.4.2.3.4 DIF

Upon inspection of DIF for the age groups, there were no signs of item bias across the two age groups. The biggest difference between item locations for the two groups was .17 logits, which is small. Furthermore, none of the comparisons between groups were statistically significant. In essence, the two age groups (individuals younger than 40 (Group 1) and older than 40 (Group 2)) interpreted the *Relational crafting* items in the same way.

With reference to gender, however, there was evidence of DIF. In particular, JCQ13 displayed a statistically significant (p = .0038) DIF contrast of .32. The DIF measure for men and women was .98 and .66 respectively, suggesting that men found JCQ13 more difficult to endorse than women did. Although the DIF contrast between genders was statistically significant, it was not sizeable enough to be considered practically significant; therefore, we were not concerned. Figure 12, below, illustrates the presence of DIF for JCQ13.

[3] The removal of JCQ14 resulted in increased item reliability and item separation. The remaining items were all within acceptable fit range, and there were no signs of misfit.

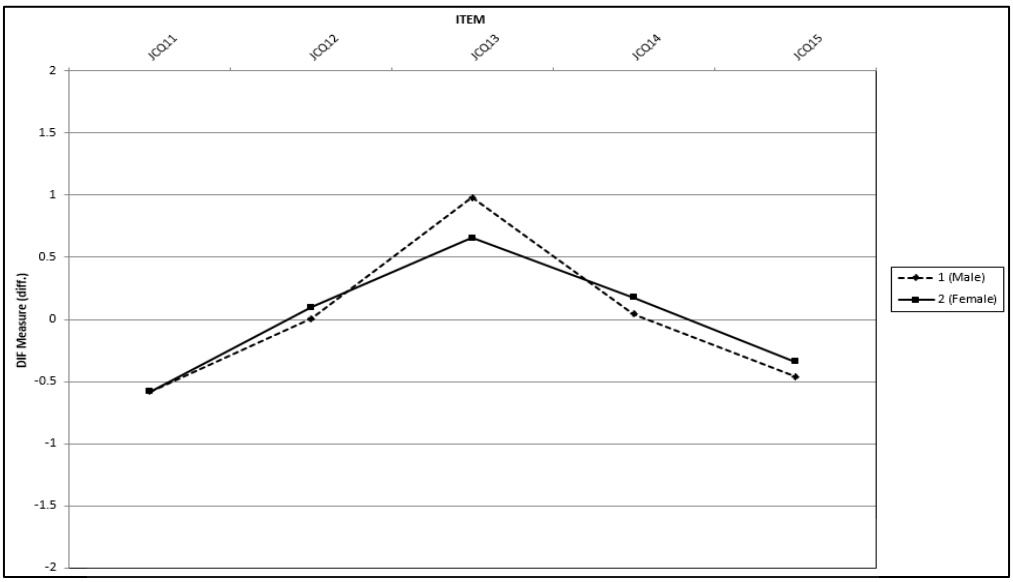

Figure 12. Differential item functioning for gender — *Relational crafting*

2.4.3 JCS

Tims et al.'s (2012) JCS consists of 21 items that measure four job crafting dimensions, namely *Increasing structural job resources*, *Increasing social job resources*, *Increasing challenging job demands*, and *Decreasing hindering job demands*. Separate analyses were conducted for each of the four dimensions. These subscales are discussed individually below.

2.4.3.1 Increasing structural job resources

2.4.3.1.1 Rating scale analysis

Increasing structural job resources consists of five items that are rated on a five-point frequency scale (*1 = Never; 2 = Seldom; 3 = Regularly; 4 = Often; 5 = Very often*). Visual inspection of the category probability curves showed distinct peaks and clear thresholds for each response format, and it is likely that this response structure will hold true for future samples (Linacre, 2016a). In terms of the category fit statistics, which indicate how the response structure worked for *this* specific sample (Linacre, 2016a), there was evidence of category misfit. Category 1 (infit MNSQ = 1.62; outfit MNSQ = 1.59) and Category 2 (infit MNSQ = 1.50; outfit MNSQ = 1.29) showed underfit. The remaining categories produced acceptable fit statistics, ranging between .78 and .98. Prior to collapsing any of the categories, it was decided to remove any misfitting individuals who may have been the reason for the category misfit. Eighteen (n = 18) individuals were identified as showing excessive misfit, and

were removed from the analysis[4]. The data were then reanalysed and compared, and the categories appeared to display proper functioning, with acceptable fit. Table 10, below, contains the frequencies, fit statistics, Andrich thresholds, and category measures for each category after the removal of the misfitting cases.

Table 10

Category Frequencies for Increasing Structural Job Resources

Response category	**Observed**	**%**	**Infit MNSQ**	**Outfit MNSQ**	**Andrich Threshold**	**Category Measure**
1 (Never)	6	0	.72	.66	NONE	(-6.31)
2 (Seldom)	93	6	1.47	1.15	-5.18	-3.65
3 (Regularly)	553	37	.95	.97	-2.11	.14
4 (Often)	484	32	.89	.81	2.40	3.65
5 (Very often)	364	24	.92	.92	4.89	(6.04)

As can be seen above, Categories 1 and 2 captured the least responses, whereas Categories 3, 4, and 5 captured more than 90% of the total responses. Category 1 had a very low frequency count of only six responses. Linacre (2016a) recommends that each category should have a minimum of ten responses, and although Category 1 did not meet this criterion, the fit statistics and Andrich thresholds for this category were in line with Rasch model expectations. Usually, when there are low category frequencies, it is an indication of redundancy, and it is often combined with disorder in the category measures and thresholds (Bond & Fox, 2007). In this case, however, there was no disordering, merely low frequencies.

In terms of category fit, the mean infit MNSQ ranged from .72 to 1.47 and the outfit MNSQ ranged from .66 to 1.15. Category 2 displayed some underfit, with an infit MNSQ of 1.47. According to Linacre (2016a), category misfit of less than 2 is acceptable for practical purposes, and a stricter cut-off would be values less than 1.5. Category 2 met both these

[4] The removal of the misfitting individuals increased the person reliability from .79 to .84 and the person separation index from 1.97 to 2.31. The Cronbach alpha also increased from .84 to .88.

criteria, and was thus considered satisfactory[5]. Looking at the Andrich thresholds and category measures, the values increased monotonically across the rating scale, which was indicative of proper functioning.

Figure 13, below, depicts a Wright Map of the *Increasing structural job resources* dimension across the five categories and the four Andrich thresholds. As can be seen, the majority of the individuals were situated towards the higher end of the construct, which was best matched by Categories 4 and 5. That is, these individuals scored high on *Increasing structural job resources* and were most likely to endorse Categories 4 and 5 across the five items. Contrastingly, there were strikingly fewer individuals located at the lower end of the construct, which would have been best captured by Category 1. In this case, Category 1 did not do well at targeting those individuals who scored low on this dimension, and therefore provided little valuable information (as was identified earlier in the analysis). We can say, however, that the categories functioned as expected, with each increase in the underlying construct being matched with an increase in the rating scale category. Looking at the means for the persons and items, the mean person ability exceeded the mean item difficulty/endorseability by almost three logits, suggesting that the sample found this sub-test fairly easy to endorse.

[5] For comparative purposes, we decided to collapse Categories 1 and 2 to form one category. The new four-point scale was analysed and compared to the original five-point scale. The newly collapsed category showed misfit with an infit MNSQ of 1.44; hence, there was no improvement after collapsing Categories 1 and 2.

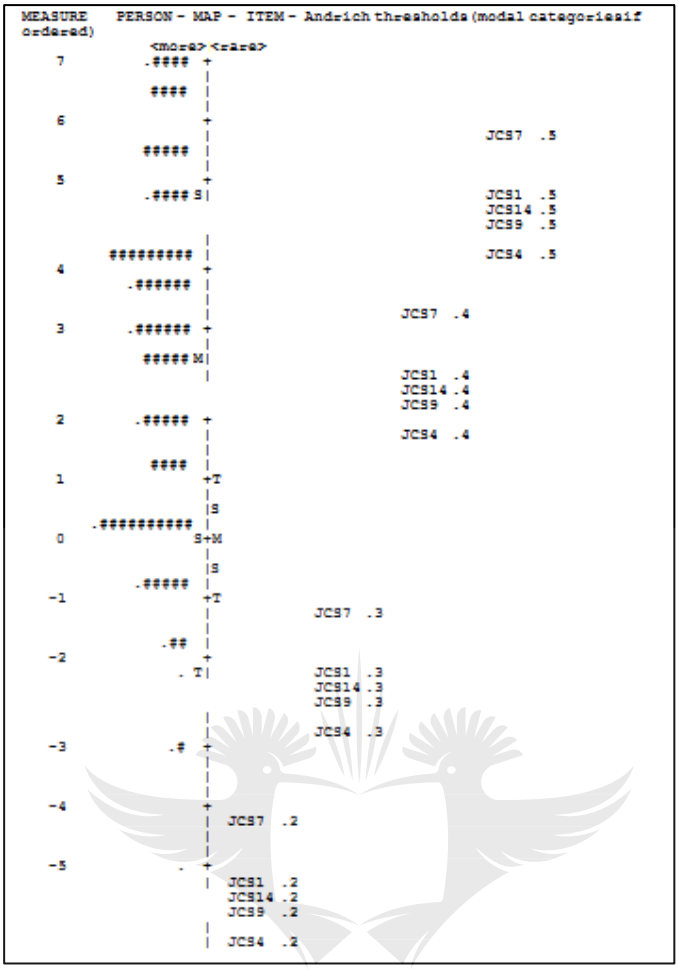

Figure 13. Category thresholds and item/person locations along the *Increasing structural job resources* dimension.

2.4.3.1.2 Item statistics

Initial investigation of the ICCs was conducted to determine whether the items behaved as expected. JCS7 ("I decide on my own how I do things") seemed to show slight misfit, with individuals who scored low on the dimension scoring higher than expected, and those high on the dimension scoring lower than expected. This was evident in the deviation between the item's expected and observed score ICC. Furthermore, upon review of the item-to-total correlations, JCS7 was the only item that had a large difference between its expected item-to-total correlation (.79) and its observed item-to-total correlation (.66). The sample was then split into two groups, and cross-plots were conducted to see whether JCS7 indeed functioned differently for low and high performers. Cross-plots showed JCS7 to be biased between the two groups, producing a statistically and practically significant (p = .0012) DIF contrast of .69. Individuals who scored high on *Increasing structural job resources* (i.e. DIF measure =.98)

found JCS7 more difficult to endorse than those with a low score on this dimension (DIF measure = .29).

In terms of the summary fit statistics, the mean infit and outfit MNSQ for persons were .97 (SD = 1.01) and .95 (SD = 1.00) respectively. For the items, the mean infit and outfit MNSQ were .99 (SD = .32) and .96 (SD = .32) respectively. Table 11, below, contains the item locations, standard errors, and fit statistics for each of the items.

Table 11

Summary Item Fit Statistics: Increasing Structural Job Resources

			INFIT		OUTFIT	
Item	Measure	SE	MNSQ	T	MNSQ	t
JCS7	.76	.10	1.59	6.3	1.55	5.8
JCS14	-.02	.10	.72	-3.7	.71	-3.7
JCS9	-.15	.10	.78	-3.0	.76	-3.0
JCS1	-.19	.10	1.07	.9	1.06	.7
JCS4	-.40	.10	.77	-3.0	.71	-3.6
SD	.40	.00	.32	3.8	.32	3.7

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse. Item statistics are based on the total sample (n = 318).

Table 11 shows that JCS7 was the most difficult item to endorse (δ = .76), whereas JCS4 was the easiest to endorse (δ = -.40). Item infit ranged from .72 to 1.59, and outfit ranged from .71 to 1.55. All items, except for JCS7, had acceptable fit. JCS7 showed overfit, with an infit and outfit MNSQ of 1.59 and 1.55 respectively. The above statistics confirmed the misfit of JCS7 that was previously identified, and it should be considered setting this item aside in future administrations.

2.4.3.1.3 Reliability and separation statistics

Reliability was investigated for the full five-item scale across the total responses. The person reliability was .79, and the separation index was 1.97. The reported item reliability was .93, with an item separation index of 3.69. Cronbach's alpha was .84. After the removal of JCS7, the person reliability and separation index increased to .81 and 2.07 respectively.

2.4.3.1.4 DIF

Item bias, or DIF, was explored across two categories, age and gender. In terms age, there were no signs of DIF. With regard to gender, however, DIF was present for Item JCS1 and Item JCS4 across genders. JCS1 produced a statistically and practically significant (p = .0015) DIF contrast of .64 between genders. Men scored a DIF measure of .18, while women scored a DIF measure of -.46, suggesting that men found this item more difficult to endorse than women did. JCS4, on the other hand, produced a statistically significant (p = .0425) DIF contrast of .42 between genders. Men scored a DIF measure of -.64, while women scored a DIF measure of -.23, suggesting that women found this item more difficult to endorse than men did. Figure 14, below, displays the DIF between genders across all the items.

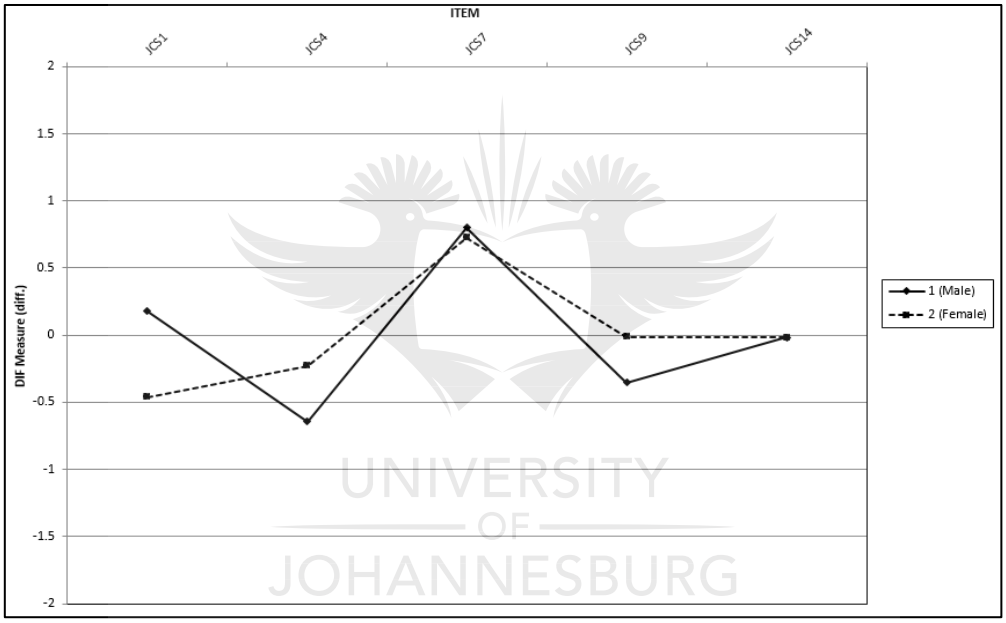

Figure 14. Differential item functioning for gender (*Increasing structural job resources*)

2.4.3.2 Increasing social job resources

2.4.3.2.1 Rating scale analysis

Increasing social job resources consists of five items, which are scored on a five-point frequency rating scale, where *1 = Never, 2 = Seldom, 3 = Regularly, 4 = Often, and 5 = Very often*. Upon inspection of the category probability curves, each of the categories showed distinct peaks, and there were four clear thresholds separating the categories. That is, each category was most probable across some point on the underlying construct. Table 12, below, contains the frequencies, fit statistics, Andrich thresholds, and category measures for each category.

Table 12

Category Frequencies for Increasing Social Job Resources

Response category	Observed	%	Infit MNSQ	Outfit MNSQ	Andrich Threshold	Category Measure
1 (Never)	197	13	1.01	.98	NONE	(-4.04)
2 (Seldom)	505	32	.93	.92	-2.88	-1.76
3 (Regularly)	446	28	.96	.97	-.51	.14
4 (Often)	291	19	.93	.98	.86	1.79
5 (Very often)	126	8	1.25	1.23	2.52	(3.75)

Note. The above results are based on a sample of 315 individuals. That is, three problematic individuals were removed from the analysis.

Table 12 shows that the least-used category was Category 5 (8%) and the most-used category was Category 2 (32%). The categories produced satisfactory fit, with an infit MNSQ ranging from .93 to 1.25 and an outfit MNSQ ranging from .92 to 1.23. Category 5 stands out somewhat, as its fit values were substantially larger in comparison to the others; however, its fit statistics were still within the desired range (>.75 < 1.30). The large fit values for Category 5 may have been the result of the low frequency count. With regard to the Andrich thresholds and category measures, the values increased monotonically, as desired. That is, the higher individuals scored on *Increasing social job resources*, the more likely they were to endorse a higher category. Figure 15, below, is a Wright Map of the *Increasing social job resources* dimension.

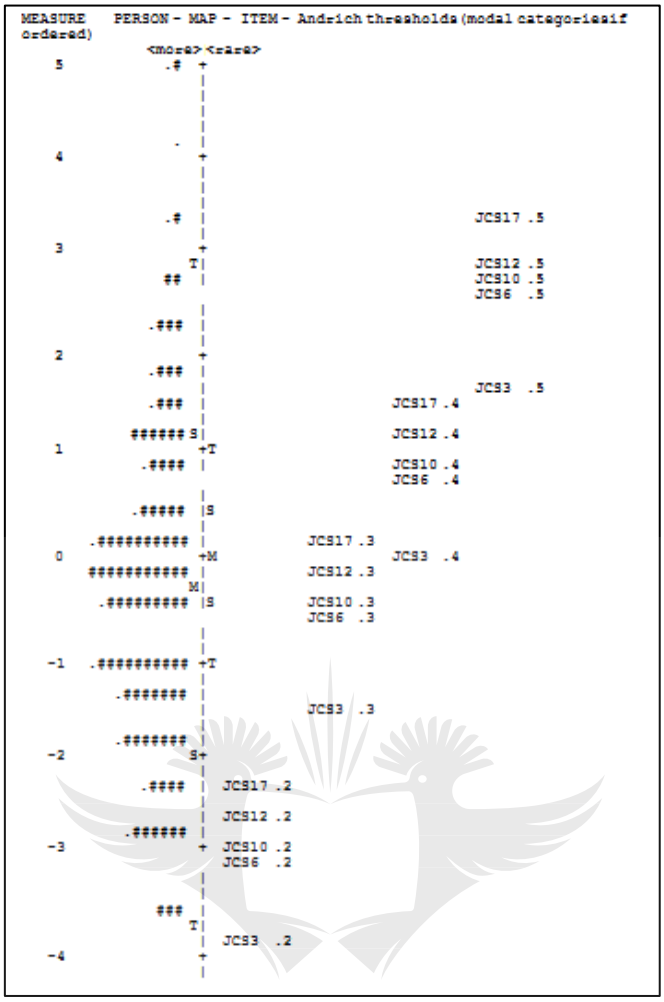

Figure 15. Category thresholds and item/person locations along the *Increasing social job resources* dimension

Figure 15 shows that the sample was predominantly located between -2 and 2 logits, and their levels of *Increasing social job resources* was best captured by Categories 3 and 4. We can see that the categories covered the whole range of the construct, ranging from -4 to 4 logits. The categories functioned as expected, with each increase in *Increasing social job resources* matched with an increase in the response category. With regard to the means, the mean person ability and item difficulty/endorseability were closely matched, suggesting that the items did well at targeting the individuals' social job crafting behaviour, and that the items were a good match for this sample.

2.4.3.2.2 Item statistics

Investigation of item performance began by visually inspecting the ICCs. JCS3 appeared to be the only item that showed peculiar behaviour. Specifically, the observed (empirical) ICC was

misaligned with the expected (theoretical) ICC, and the empirical curve fell slightly outside the 95% confidence interval band. For JCS3, individuals who scored low on the dimension were scoring higher than expected, and those who scored high on the dimension were scoring lower than expected. However, JCS3 did do well at targeting individuals who were located towards the centre of the construct. Despite the somewhat erratic behaviour of JCS3, as evidenced by its ICC, the fit statistics provide sufficient reason to retain the item.

In terms of the summary fit statistics, the mean infit and outfit MNSQ for persons were 1.00 (SD = .88) and 1.00 (SD = .88) respectively. With regard to the items, the mean infit and outfit MNSQ were 1.00 (SD = .10) and 1.00 (SD = .14) respectively. Table 13[6], below, contains the item locations, standard errors, and fit statistics for each of the items.

Table 13
Summary Item Fit Statistics: Increasing Social Job Resources (n = 315)

			INFIT		**OUTFIT**	
Item	Measure	SE	MNSQ	T	MNSQ	t
JCS17	.64	.08	.86	-1.8	.80	-2.6
JCS12	.29	.08	1.12	1.4	1.09	1.2
JCS10	.02	.08	.98	-.3	.96	-.5
JCS6	-.02	.08	.95	-.6	.95	-.7
JCS3	-.92	.08	1.10	1.2	1.20	2.4
SD	.52	.00	.09	1.2	.11	1.4

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse.

Table 13 shows that JCS17 was the most difficult item to endorse (δ = .64), while JCS3 was the easiest to endorse (δ = -.96). The items showed acceptable fit with an infit MNSQ ranging from .86 to 1.12 and an outfit MNSQ ranging from .80 to 1.20. All the items were within the desired fit range of .75 and 1.30 as well as in the 'productive for measurement' range proposed by Linacre (2016a).

[6] Table 13 contains the item statistics after three problematic cases were removed (n = 315). Prior to their removal, JCS3 showed misfit, with an outfit MNSQ of 1.36.

2.4.3.2.3 Reliability and separation statistics

The person reliability for this dimension was .80, with a person separation index of 2.02. The item reliability was .98, with an item separation index of 6.26. Cronbach's alpha was .83, indicative of good internal consistency[7].

2.4.3.2.4 DIF

To investigate whether the items functioned invariantly across the sample, a DIF analysis was conducted for two categories, namely age and gender. With regard to age, there were signs of DIF for JCS6. JCS6 produced a statistically significant (p = .0372) DIF contrast of .36, with younger individuals scoring a DIF measure of .10 and older individuals scoring -.26, suggesting that the younger individuals found this item slightly more difficult to endorse than their older counterparts did. The DIF contrast was not practically significant (> .50), and was so small that we were not concerned. Figure 16, below, displays the DIF contrast between age groups. Although it may appear that DIF existed for some of the other items, their DIF contrasts were not statistically significant.

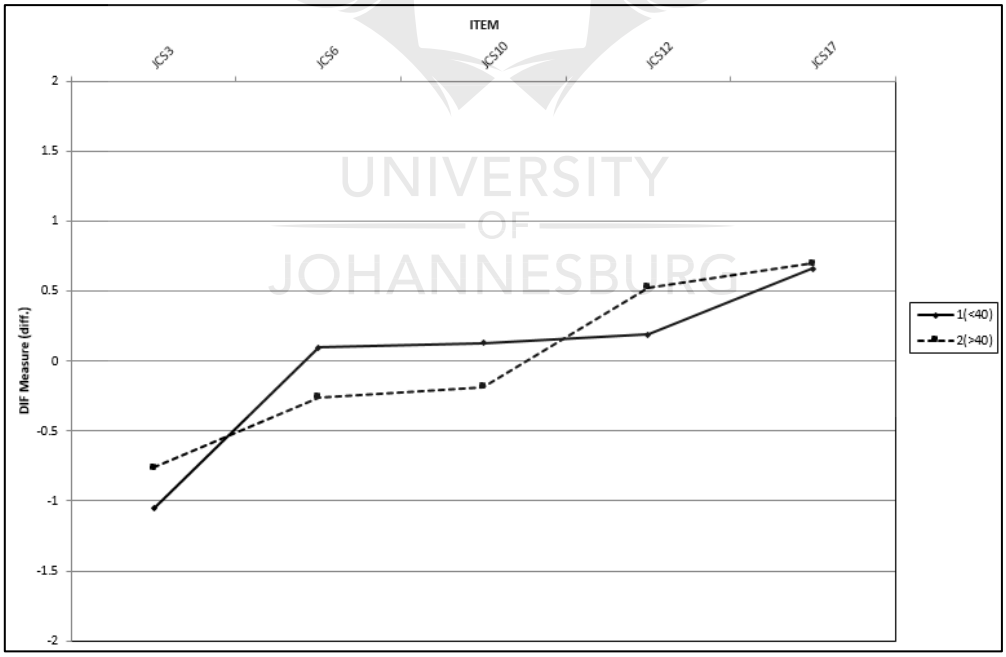

Figure 16. Differential item functioning for age (increasing social job resources)

[7] The reliability statistics are based on a total of 315 individuals, after three problematic cases were removed.

2.4.3.3 Increasing challenging job demands

2.4.3.3.1 Rating scale analysis

Increasing challenging job demands consists of five items, rated on a five-point frequency scale, where *1 = Never*, *2 = Seldom*, *3 = Regularly*, *4 = Often*, and *5 = Very Often*. Visual inspection of the category probability curves showed distinct peaks for each of the five categories, suggesting that each category was most probable at some point along the underlying construct. Table 14, below, contains the frequencies, fit statistics, Andrich Thresholds, and category measures for each of the categories.

Table 14 shows that Category 1 captured 4% of the total responses, and was the least-used response option, While Category 3 was the most used, with 35% of the total responses being captured by this category. All the categories showed acceptable fit, with the infit MNSQ ranging from .85 to 1.27 and the outfit MNSQ ranging from .83 to 1.19. In terms of the last two columns, the Andrich thresholds and category measures displayed proper functioning; an increase in response category was matched by an increase in category measure.

Table 14

Category Frequencies for Increasing Challenging Job Demands

Response category	Observed	%	Infit MNSQ	Outfit MNSQ	Andrich Threshold	Category Measure
1 (Never)	56	4	1.27	1.19	NONE	(-4.45)
2 (Seldom)	343	22	1.08	1.06	-3.29	-2.08
3 (Regularly)	550	35	.91	.93	-.79	.18
4 (Often)	393	25	.85	.83	1.21	2.09
5 (Very often)	218	14	1.03	1.02	2.87	(4.10)

Note. The above results are based on a sample of 312 individuals. That is, six individuals who were the reason for category misfit were removed from the analysis.

Figure 17 depicts a Wright Map of the *Increasing challenging job demands* dimension across the five categories (four thresholds). As can be seen in the figure, the sample followed a normal distribution, with the majority of the individuals being located between -1 and 2 logits. The categories were spread evenly across the dimension, with low levels of the dimension being

measured by Categories 1 and 2, and higher levels measured by Categories 4 and 5. Looking at the left side of the figure (vertical line), we can see that only a few individuals were not targeted well by these items; perhaps the items were too easy for them to endorse. With regard to the means, the mean person ability and the mean item difficulty/endorseability were close to one another, suggesting that these items were a good match for this sample.

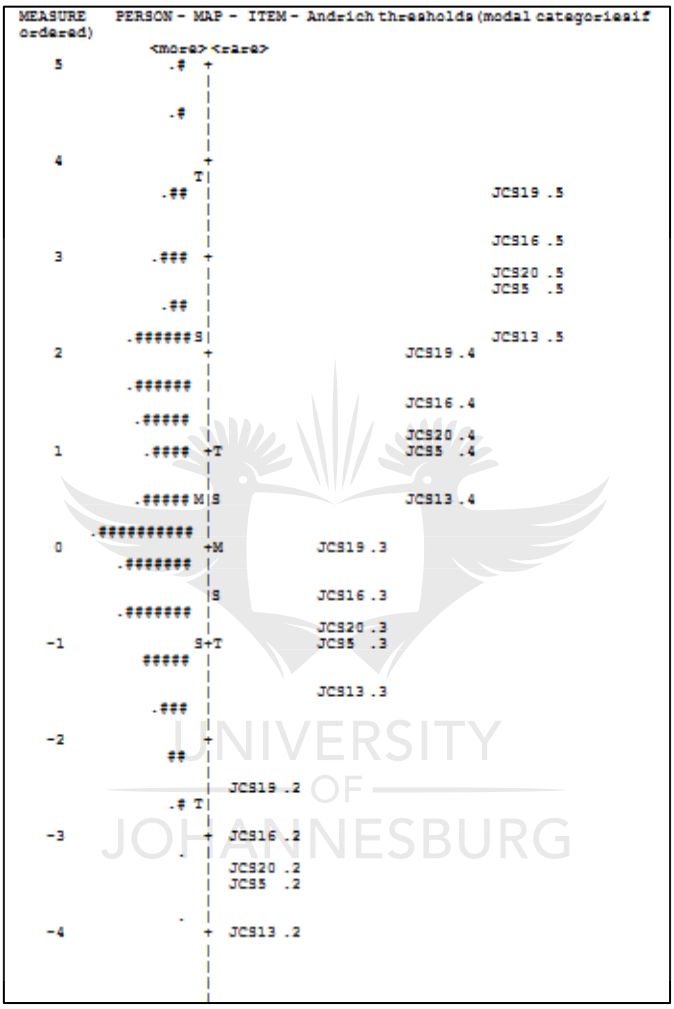

Figure 17. Category thresholds and item/person locations along the increasing challenging job demands dimension

2.4.3.3.2 Item statistics

The performance of the five items began with an inspection of the ICCs. JCS16 appeared to be the only item that showed misfit, as the empirical curve deviated substantially from the theoretical curve for individuals who scored low on *Increasing challenging job demands*. That is, individuals with low levels of the dimension (between -3 and -4 logits) endorsed Category 3 (*Regularly*), where, in fact, they were expected to endorse Category 1 (*Never*). This led to

the empirical curve for this item falling outside the 95% confidence interval band. Despite the potential misfit of the item, the fit statistics provide us reason to retain the item.

In terms of the summary fit statistics, the mean infit and outfit MNSQ for persons were .99 (SD = .81) and .98 (SD = .80) respectively. The mean infit and outfit MNSQ for the items were 1.00 (SD = .15) and .98 (SD = 13) respectively. Table 15, below, contains the item locations, standard errors, and fit statistics for each of the items.

Table 15

Summary Item Fit Statistics: Increasing Challenging Job Demands (n = 312)

			INFIT		**OUTFIT**	
Item	Measure	SE	MNSQ	T	MNSQ	t
JCS19	.78	.08	1.08	1.0	1.04	.6
JCS16	.31	.08	1.04	.6	1.03	.4
JCS20	-.11	.08	.86	-1.9	.84	-2.1
JCS5	-.22	.08	.79	-2.8	.84	-2.2
JCS13	-.76	.08	1.22	2.6	1.17	2.0
SD	.52	.00	.15	2.0	.13	1.6

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse. Six problematic cases were deleted from the analysis, as they caused some of the items to misfit.

Table 15, above, shows that JCS19 was the most difficult item to endorse (δ = .78), whereas JCS13 was the easiest to endorse (δ = -.76). The infit MNSQ ranged from .79 to 1.22, and the outfit MNSQ ranged from .84 to 1.17. The fit statistics for these items were indicative of acceptable fit, as they all fell within the desired fit range of .75 to 1.30.

2.4.3.3.3 Reliability and separation statistics

For the *Increasing Challenging Job Demands* dimension, the person reliability was .79, and the person separation index was 1.92. The item reliability was .97, with an item separation index of 5.88. The Cronbach alpha was .81.

2.4.3.3.4 DIF

Item DIF was explored across two categories, namely age and gender. For age, there were no signs of DIF. That is, individuals younger than the age of 40 and individuals over the age of 40 interpreted the items in the same way. With regard to gender, however, there was evidence of item bias. JCS13 and JCS19 presented DIF between the two genders. JCS13 produced a statistically and practically significant (p = .0005) DIF contrast of .60, with men scoring a DIF measure of -.43 and women scoring a DIF measure of -1.02. That is, men found JCS13 more difficult to endorse than women did. JCS19 produced a statistically and practically significant (p = .0008) DIF contrast of .57, with men scoring a DIF measure of .46 and women scoring a DIF measure of 1.03. In this case, women found this item more difficult to endorse than men did. Given the practical significance of the DIF contrasts for these two items, they should probably be set aside in future if the aim is to differentiate between genders. Figure 18, below, depicts the DIF contrasts between genders across the five items that make up this dimension.

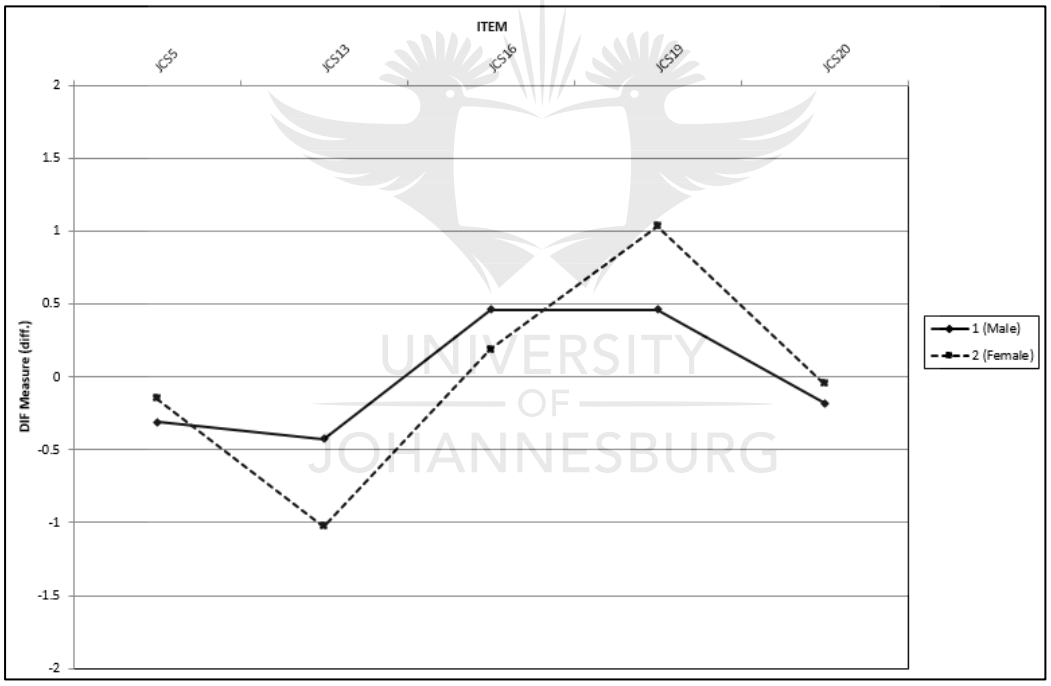

Figure 18. Differential item functioning according to age (*Increasing challenging job demands*)

2.4.3.4 Decreasing hindering job demands

2.4.3.4.1 Rating scale analysis

The final dimension, *Decreasing hindering job demands*, consisted of six items that were rated on a five-point frequency scale, where *1 = Never*, *2 = Seldom*, *3 = Regularly*, *4 = Often*, and *5 = Very often*. Visual inspection of the category probability curves showed distinct peaks for each category, and four clear thresholds separating them, suggesting that each category was

most probable at some point along the underlying construct. Table 16, below, contains the frequencies, fit statistics, Andrich thresholds, and category measures for each of the categories.

Table. 16

Category Frequencies for Decreasing Hindering Job Demands

Response category	**Observed**	**%**	**Infit MNSQ**	**Outfit MNSQ**	**Andrich Threshold**	**Category Measure**
1 (Never)	295	15	1.16	1.07	NONE	(-3.94)
2 (Seldom)	766	40	.91	.94	-2.78	-1.59
3 (Regularly)	511	27	.84	.81	-.26	.27
4 (Often)	239	13	.95	.99	.99	1.65
5 (Very often)	97	5	1.19	1.26	2.04	(3.35)

As can be seen above, Category 5 was the least chosen (5%), whereas Category 2 was the most frequently chosen category (40%) amongst this particular sample. The infit MNSQ ranged from .84 to 1.19, and the outfit MNSQ ranged from .81 to 1.26, indicative of acceptable category fit (Linacre, 2016a). The Andrich thresholds and category measures increased monotonically with each respective category, which is evidence of proper category functioning (Linacre, 2016a).

Figure 19, below, depicts a Wright Map of the *Decreasing hindering job demands* dimension across the five categories (four thresholds). The figure shows that the sample was normally distrubuted across the dimension. It is also evident that the categories worked in the desired manner, with higher levels of the dimension being best captured by higher category selections (i.e. Categories 4 and 5). Worthy of observation, however, is the large gap between the categories located between -1 and -2 logits. There are no items and/or categories that capture the ability of individuals whose scores are located in this range on the continuum, suggesting that the categories did not do very well at targeting individuals who score relatively low on this dimension. Looking at the means, the mean item difficulty/endorseability was slightly higher than the mean person ability, but they were still close enough to be considered a good item-to-person match for this sample.

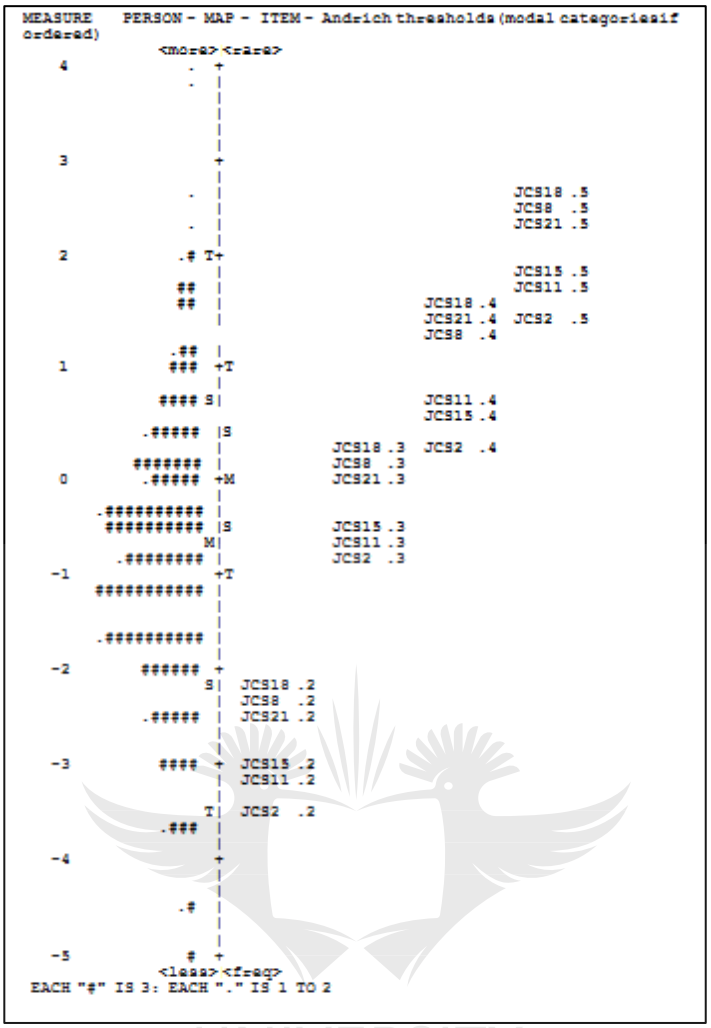

Figure 19. Category thresholds and item/person locations along the *Decreasing hindering job demands* dimension

2.4.3.4.2 Item statistics

The ICCs were first inspected to get a very general feel of how the items functioned for this particular sample. All the items appeared to show acceptable fit, as all ICCs fell within the 95% confidence interval. JCS8, however, showed some peculiar behaviour, with individuals scoring high on the dimension scoring lower than expected. Specifically, there were some individuals who would have been expected to endorse Category 5, but, instead, they endorsed Category 4 for this particular item. Perhaps these individuals found it difficult to distinguish between "*Often*" and "*Very often*". Despite the unusual behaviour of JCS8, based on visual inspection of its ICC, there was no supporting statistical evidence for us to remove the item.

With regard to the summary fit statistics, the mean infit and outfit MNSQ for persons were 1.00 (SD = .89) and .99 (SD = .87) respectively. In terms of the items, the mean infit and outfit

MNSQ were 1.00 (SD = .05) and .99 (SD = .06) respectively. Table 17, below, contains the item locations, standard errors, and fit statistics for all the items.

Table 17

Summary Item Fit Statistics: Decreasing Hindering Job Demands (n = 318)

			INFIT		OUTFIT	
Item	Measure	SE	MNSQ	*t*	MNSQ	*t*
JCS18	.58	.08	.98	-.2	.93	-.9
JCS8	.41	.08	1.04	.5	1.03	.4
JCS21	.32	.08	1.01	.1	.99	-.1
JCS15	-.27	.08	.94	-.7	.94	-.7
JCS11	-.39	.08	.95	-.7	.97	-.3
JCS2	-.66	.07	1.09	1.2	1.10	1.3
SD	.46	.00	.05	.7	.06	.7

Note. Items appear in descending order, from most difficult to endorse to easiest to endorse

Table 17 shows that JCS18 was the most difficult item to endorse (δ = .58), whereas JCS2 was the easiest to endorse (δ = -.66). All the items showed satisfactory fit, with the infit MNSQ ranging from .94 to 1.09 and the outfit MNSQ ranging from .93 to 1.10. As can be seen, JCS8, which was previously flagged for potential misfit, displayed acceptable fit statistics.

2.4.3.4.3 Reliability and separation statistics

For the *Decreasing hindering job demands* dimension of job crafting, the person reliability was .78, with a person separation index of 1.86. The item reliability was .97, with an item separation index of 5.72. The Cronbach alpha was .81.

2.4.3.4.4 DIF

DIF was explored across two categories, age and gender. With regard to age, there was no item bias. JCS11, did however, produce a statistically significant chi-square value of .0121, but the Rasch-Welsh probability statistic was not statistically significant (p = .0635), and the DIF contrast (.30) was so small that it was not cause for concern. There was no signs of DIF for gender; that is, men and women interpreted the items in the same way.

2.5 DISCUSSION

Through the application of the Rasch model, the present study investigated the psychometric properties of three organisational behaviour measures, namely the Self-Undermining Scale (Bakker & Wang, in press), the JCS (Tims et al., 2012), and the JCQ (Slemp & Vella-Brodrick, 2013). The instruments were analysed with respect to their category and item functioning, their reliability, and their ability to measure invariantly across individuals. In summary, the scales performed well under Rasch model expectations, with the exception of a few problematic items that were flagged during the Rasch analysis. A detailed discussion of the findings with respect to each scale is provided below.

2.5.1 The Self-Undermining Scale

Considering the category fit statistics, category measures, and category thresholds for the Self-Undermining Scale, the instrument's response structure performed reasonably well under Rasch model expectations. Worthy of observation, however, is that the majority of respondents endorsed the lowest categories (*1 = Never* and *2 = Seldom*) when reporting on their self-undermining behaviour, with the three upper-most categories (*3 = Regularly, 4 = Often, 5 = Very often*) seldom being selected.

This was further corroborated in the item-person map showing that the majority of the persons' measures were located toward the lower end of *Self-undermining*. The reluctance of the respondents to report on their self-undermining behaviour may be attributable to the fact that they were not comfortable reporting on their negative work behaviours out of fear of punishment. As stated by Heneman, Heneman, and Judge (1997), whose research focuses on CWB, individuals may fear getting caught or being punished, or may simply not like to describe themselves in negative terms. This may be a result of individuals having an ongoing interest in how they are perceived and evaluated by others (Leary & Kowalski, 1990) or, from an impression management perspective, respondents may prefer to manage their impressions to avoid blame, maintain their self-esteem and identity, and present themselves in the most favourable light (Tedeschi & Reiss, 1981).

Another possible explanation is that, because the Self-Undermining Scale requires individuals to allow highly sensitive inquiries into their behaviour at work, they may consider their responses to be self-incriminating, and, as such, may underreport the extent to which they engage in self-undermining behaviour. Finally, and quite possibly, the low scores on self-

undermining behaviour may, in fact, just be a result of the respondents being good organisational citizens and rarely engaging in self-undermining behaviour at work.

In terms of the six individual items that comprise the Self-Undermining Scale, there were indications of slight misfit (i.e. overfit) for item SU1 ("I make mistakes"), which, ironically, happened to be the easiest item to endorse. According to Linacre (2016a), overfit means that the item was predicted too well by the Rasch model, which often results from a few unexpected responses by persons on items that are, relatively, very easy to endorse. It may also be the case that a few individuals (e.g., outliers) used the response format incorrectly, or that the majority of respondents responded in an extreme manner to this item; that is, they endorsed the lowest category possible (*1 = Never*) when answering this item, resulting in the slight overfit. Netemeyer et al. (2003) and Clark and Watson (1995) contend that items that are written in a way that everyone will respond to them in the same way (either negatively or positively) are of little use, and will subsequently produce little item variance and contribute little to the content validity of the construct. However, the slight overfit of this item was trivial. In fact, high outfit poses less threat to measurement than does high infit (Linacre, 2016a), and, in this case, the outfit was truly small. Moreover, cross-plots of person measures showed that the exclusion of this item made no difference in the person measures, suggesting that no harm will be caused if this item is included in future administrations to measure behavioural self-undermining.

Bond and Fox (2007) state that further investigation needs to be undertaken for misfitting items, such as an inspection of the item content or wording. Netemeyer et al. (2003) suggest that items should be clear in the way they are written (i.e. they should not be redundant or ambiguous in their description). Looking at the content of item SU1 ("I make mistakes"), the item description is rather vague, as it does not refer to any particular context, and, as such, individuals may be confused as to whether they make mistakes at work or in other aspects of their life (e.g., at home). Given that self-undermining behaviour is related specifically to the work context, perhaps one should consider reformulating the item to read "I make mistakes *at work*," which may aid proper item functioning and individuals providing more accurate and less random responses.

With regard to person reliability, which is proposedly equivalent to Cronbach's alpha (Linacre, 2016a), the internal consistency of the scale was good, echoing similar reliability coefficients

reported in the developmental study of the Self-Undermining Scale by Bakker and Wang (2016). However, the scale did not do as well at separating the individuals in terms of the parameters (i.e. > 2) set by Linacre (2016a). This may be attributable to the fact that the majority of the sample reported low levels of self-undermining behaviour, and, as such, the scale could not obtain sufficient estimates of high self-underminers. Wilson (2005) states that response categories should capture both high and low levels of the trait, which, in the present study, the Self-Undermining Scale did not. Perhaps more items should be added that tap into varying degrees of the self-undermining construct, or less categories should be used in measuring this type of behaviour. With regard to the item reliability and separation, the sample did well at distinguishing the hierarchical ordering of the items, and, as such, we can expect the same item ordering to occur amongst similar samples in future administrations (Bond & Fox, 2007; Linacre, 2016a).

Lastly, a DIF analysis was conducted to investigate item invariance across two sub-groups, namely age and gender. Findings showed that SU3 ("I create confusion when I communicate with others at work") was the only item that appeared to be biased across genders. In particular, men found this item more difficult to endorse than women did, suggesting that this item may carry conceptual differences for the two genders, and that men and women may differ in their styles of communication at work. Previous research and meta-analytic studies have indeed found gender differences in communication. For example, Fishman (1978) reported that men, in comparison to women, often ignore the communications of others, while Anderson and Leaper (1998), in their meta-analysis, found that men interrupt more during communication than women do. James and Drakich (1993) also pointed to the fact that men talk more than women in a variety of professional contexts. Although not specific to gender, Bakker and Wang (in press), who performed a multigroup CFA in the developmental stages of the Self-Undermining Scale, stated that there was evidence of item invariance across countries for some of the items of the scale. Taken together, it may be useful setting SU3 aside in future administrations if the purpose of the study is to detect gender differences in self-undermining behaviour.

2.5.2 The JCQ

The JCQ (Slemp & Vella-Brodrick, 2013) measures three forms of job crafting behaviour, namely task, cognitive, and relational crafting, which are discussed below.

2.5.2.1 Task crafting

Observations of the category fit statistics, category measures, and category thresholds provided evidence of proper category functioning for the *Task crafting* dimension. All the categories displayed acceptable fit, with their respective category measures and thresholds increasing monotonically, as required (Linacre, 2016a). It was noticeable, though, that the majority of responses were captured by the three upper-most categories, with less than 9% of the sample opting for Categories 1 and 2. This suggests that the sample quite frequently engaged in task-crafting behaviour. The Wright Map provided some useful information over and above the category fit statistics. For example, the map showed that there was some degree of task-crafting behaviour that was not accounted for or targeted well by the six categories (between 1.5 and 2 logit values), suggesting that additional items should be added to effectively capture the entirety of the construct.

In terms of item fit, JCQ5 ("Give preference to work tasks that suit your skills or interests") was the only problematic item that displayed excessive underfit, which means it contained some unexplained variance that was unaccounted for by the Rasch model, and, which, according to Linacre (2016a), has the potential to degrade measurement. Looking at the content of the item, it asks individuals to rate the extent to which they give preference to certain work tasks that better suit their skills *or* interests. From a conceptual standpoint, the item is double-barrelled, as skills and interests are two related, yet distinct, concepts. For example, one might be interested in computer programming, but not necessarily skilled at it. Netemeyer et al. (2003) offer useful tips for constructing psychological measurement instruments, one being that items should be unambiguous and devoid of any double-barrel statements that essentially address two issues in one statement.

Taking it a step further, responses to item JCQ5 ("Give preference to work tasks that suit your skills or interests") may cause feelings of uneasiness or discomfort for individuals, because there are always aspects of the job that individuals are required to perform, regardless of whether they prefer to do the task or not, or whether they are interested or skilled at it — it is just an inherent part of the job and forms part of their job description. In their popular and often-cited piece on job-crafting behaviour, Wrzesniewski and Dutton (2001) state that, "even in the most restricted and routine jobs, employees can exert *some* influence on what is the essence of the work" (p. 179). Regarding the word "some" in the statement, it is plausible to

argue that the chances of employees being able to exercise full or complete discretion over the job, in general, is slightly less probable. So, although employees may exercise some preference over which tasks to perform, given the amount of autonomy and latitude the organisation provides, there will always be certain aspects of the job (e.g., administration) that the individual has less preference for, but has to do anyway to ensure the smooth functioning of the organisation.

The DIF analysis further highlighted that JCQ5 is biased across age groups, with younger individuals finding the item slightly easier to endorse than their older counterparts. The finding suggests that younger and older employees interpret the item differently, and perhaps differ in the way they change their working characteristics via task-crafting behaviour. Although qualitative in nature, previous research has indeed found that age has an effect on job-crafting behaviour. Older employees tend to engage more in task crafting behaviour to share their knowledge and to deal with their decreased physical abilities, whereas younger employees tend to engage in task crafting to develop themselves (El Baroudi & Khapova, 2017; Van den Oetelaar, 2011). Although statistically significant, the size of the DIF contrast for JCQ5 was so small that it could not be considered practically significant. Given the problematic nature of this item, however, as previously highlighted by the misfit and DIF results, it may be useful setting this item aside in future administrations, as it does not contribute to constructive measurement.

With respect to the reliability of the *Task crafting* dimension, results showed that it had good internal consistency. The separation index, however, was relatively small (< 2), suggesting that the scale was not as successful at distinguishing between low and high task crafters. The low separation may be a result of two things, namely the sample size not being large enough for the scale to discriminate effectively, or because the majority of the respondents endorsing the highest categories possible, which made it difficult to obtain proper estimates (i.e. measures) for low task crafters. The latter is probably the most likely cause, because results showed that the sample did well at determining the hierarchical ordering of the items, which was evident in the high item reliability and separation index.

2.5.2.2 Cognitive crafting

The same pattern of category functioning recurred for the *Cognitive crafting* dimension. That is, there was acceptable category fit and the Andrich thresholds and category measures

advanced across the rating scale as desired. Again, the upper-most categories (4|5|6) captured the majority of the responses, with the three lower categories hardly being chosen by the sample. Category 1 (*Never*) seemed to display some misfit in comparison to the other categories in terms of the desired fit range (i.e. .75 to 1.30), which may have been a result of the low frequency count for this category. However, in line with Linacre's (2016a) recommendations for problematic categories (i.e. > 1.50), it was still considered an acceptable fit. The Wright Map showed that each category captured a unique piece of the cognitive crafting dimension; however, there was some vital information that was not targeted at all by the categories (between 1 and 2 logit values). Furthermore, the mean person ability exceeded the mean item difficulty, indicating that the test was fairly easy for the sample to endorse. To address both these shortcomings, it is recommended that more difficult items be added that tap into higher levels of the *cognitive crafting* construct.

With regard to the items that made up the *Cognitive crafting* dimension, the fit statistics showed that each item showed acceptable fit and adhered to Rasch model expectations. There were some issues when it came to the DIF analysis, however. JCQ6 ("Think about how your job gives your life purpose") and JCQ7 ("Remind yourself about the significance your work has for the success of the organisation") presented some item bias between genders, suggesting that the items may carry different meanings for men and women. Men found JCQ6 more difficult to endorse than women did. Although significant, the DIF contrast was not practically large enough, and, therefore, we should not be concerned about this item. Women found item JCQ7 more difficult to endorse than men did, and the DIF contrast was both statistically and practically significant. Based on these findings, it is advised that JCQ7 be set aside in future if gender differences are to be interpreted for the *Cognitive crafting* dimension.

In terms of reliability, the *Cognitive crafting* dimension displayed good internal consistency. Like the *Task crafting* dimension, the separation index was relatively small, suggesting that the scale did not do well at separating high and low cognitive crafters. This, again, may be attributable to the fact that the majority of the sample opted for higher category selections, therefore making it difficult to obtain accurate estimates of low cognitive crafters. It may be useful to include items that tap into varying degrees of the underlying construct and not just those that cluster around a particular location.

2.5.2.3 Relational crafting

The final dimension of the JCQ is *Relational crafting*. Analysis of the response format showed that the categories functioned in accordance with Rasch model expectations. Like the previous two dimensions (*Task*- and *Cognitive crafting*), it was noted that the three upper-most categories were the modal categories. The Wright Map also showed that all the categories increased monotonically across the latent variable, and that there were no missing pieces of information of *Relational crafting* behaviour that were unaccounted for by the categories. The mean person ability and item difficulty were located close to the expected zero, and, as such, the sub-scale was considered a good match for the sample in terms of ability–difficulty.

In terms of the *Relational crafting* items, JCQ14 ("Choose to mentor new employees (officially or unofficially)") appeared to be the only item that displayed misfit. The underfitting nature of this item pointed to the fact that there was some unexplained variance in this item that was unaccounted for by the Rasch model (Linacre, 2016a). This finding echoes previous results reported by Slemp and Vella-Brodrick (2013). In the development of the JCQ, JCQ14 produced the second-lowest factor loading of .53 (SD = 1.51) amongst all the *Relational crafting* items, suggesting that this item explains less information of relational crafting behaviour than do the other items. The Rasch analysis in the present study confirmed this finding.

Bond and Fox (2007) advise that one should take the content of the item into account when item misfit is present. Taking the content of JCQ14 into consideration, it is plausible to argue that the wording of the item (i.e. "officially or unofficially") may be the reason for the slight misfit. In this instance, the term "officially" suggests that the individual mentors new employees because it an inherent part of the job, or because it is prescribed by his or her organisation, whereas the term "unofficially" suggests that the individual chooses to mentor new employees, not because it is part of the job, but because he or she wants to. In essence, the double-barrelled nature of this item may be causing ambiguous responses, for two potential reasons: firstly, respondents may not know what it means to "officially" or "unofficially" mentor new employees, and, secondly, respondents either choose to mentor new employees officially *or* unofficially, but not both. According to Netemeyer at al. (2003), item clarity is important, and double-barrelled statements should be avoided when developing a set of items to measure a given construct. They further advance that a good item should be unambiguous,

so that all individuals interpret the meaning of the item in the same way. In future administrations, it may be useful to eliminating the latter part of the item description (i.e. "officially or unofficially") to avoid ambiguous responses and unnecessary confusion amongst respondents.

With respect to the reliability of the *Relational crafting* dimension, results showed that it had good internal consistency, but not as high as that reported in the development of the JCQ (Slemp & Vella-Brodrick, 2013). The dimension produced a low person separation index, suggesting that it did not do well at separating low and high relational crafters, but this may, again, be attributable to the fact that the majority of respondents endorsed the highest categories available, making it difficult to obtain accurate estimates of individuals who display low levels of relational crafting behaviour. In terms of the items, there was high item reliability and separation, which suggests that the sample did well at determining the hierarchical ordering of the items (Linacre, 2016a).

Upon inspection of item bias or DIF for the *Relational crafting items*, it was found that JCQ13: "Organise special events in the workplace (e.g., celebrating a co-worker's birthday)" was interpreted slightly differently across genders, with men finding this item more difficult to endorse. The reason is not clear, but the item bias may be a result of men and women differing in the extent to which they engage in helpful acts at work, such as organising a co-worker's birthday celebration. Previous meta-analytic findings have indeed found gender differences in helping behaviour (Eagly & Crowley, 1986). In particular reference to the dimension being measured, previous research by Slemp and Vella-Brodrick (2014) reported gender differences in relational crafting. Specifically, they found that women engaged more in relational crafting than men, as evidenced in their mean scores. Despite the DIF contrast for JCQ13 being statistically significant, it was not big enough to be considered practically significant; however, it may be useful to set this item aside in future administrations if gender differences in relational crafting behaviour are to be interpreted.

2.5.3 The JCS

The JCS (Tims et al., 2012) consists of four dimensions, which were analysed separately, namely *Increasing structural job resources*, *Increasing social job resources*, *Increasing challenging job demands*, and *Decreasing hindering job demands*. Results pertaining to each dimension are discussed below.

2.5.3.1 Increasing structural job resources

Although, at first, there was excessive misfit for Categories 1 (*Never*) and 2 (*Seldom*), the removal of a few problematic individuals resulted in acceptable category fit and properly ordered Andrich thresholds and category measures. Category 2 (*Seldom*) continued to show some underfit, but the misfit was not sizeable enough to be considered problematic (Linacre, 2016a). Detailed inspection of the category frequencies showed that the majority (> 90%) of responses were captured by the three upper-most categories and the two lower categories were rarely selected by the sample. In this case, Categories 1 and 2 yielded little information about individuals' job-crafting behaviour with respect to this dimension. Furthermore, the construct map indicated that there was a large portion (between -1 and 2 logits) of the dimension that was not targeted by any of the items or categories. This is problematic, because, when studying job-crafting behaviour, the aim is to measure all individuals, not just those at the extremes. According to Linacre (2016a), when there are gaps of more than .50 logits in the item distributions, there is a need for more items to fill these gaps.

With regard to item fit, observations of the ICCs and item fit statistics showed that JCS7 ("I decide on my own how I do things") was the only problematic item. The item not only produced excessive misfit (underfit), but was also the most difficult item for respondents to endorse. It is possible, as others have suggested (Bond & Fox, 2007), that the misfit of the item is due to its content or wording. The item description asks respondents to rate how often they decide on their own how to do "things." This description seems somewhat vague in its conceptualisation, as the term "thing" does not refer to anything specific, making it difficult for the respondent to relate to and subsequently endorse. Perhaps it should be considered to restate the item to read something like "I decide on my own how I do *my work*," which may lead to more confident responses and more reliable measures of this job-crafting behaviour. As it stands, however, the Rasch model highlights JCS7 to be problematic, and researchers are cautioned against using this item in future job-crafting studies.

Despite the misfit of one item, the *Increasing structural job resources* dimension showed good internal consistency. The person separation, on the other hand, was less than desired (> 2), suggesting that the dimension did not do well at separating high and low job crafters. The low separation may be a result of the underutilisation of the lower categories. Upon the removal of JCS7, both the internal consistency and person separation increased. With regard to item

reliability and separation, the sample did well at classifying the hierarchical ordering of the items.

The final aspect to be investigated was DIF. Results showed that DIF was present for JCS1 ("I make sure I use my capacities to the fullest") and JCS4 ("I try to develop myself professionally") across genders. Men found JCS1 more difficult to endorse, whereas women found JCS4 more difficult to endorse. The DIF contrast was statistically and practically significant (i.e. large enough) for JCS1 only, and researchers are therefore cautioned against using this item in future administrations if gender comparisons are to be made with respect to this specific job-crafting behaviour. Research has indeed confirmed gender differences in job-crafting behaviour (Slemp & Vella-Brodrick, 2014), and it may just be that men and women do not use their capacities to the fullest in the same way. Further investigations need to be conducted in this regard.

2.5.3.2 Increasing social job resources

Investigations of category functioning showed that all categories functioned in accordance with Rasch model expectations. That is, the categories displayed acceptable fit, and their category measures and Andrich thresholds increased monotonically across the rating scale. The construct map pointed to the fact that there was proper category and item targeting (i.e. the entire latent variable was captured by the five categories and their respective items), and the items were a good match for the sample. Wilson (2002) states that, for categories to function effectively, they need to capture both high and low levels of the underlying construct, which, in the present study, they did. With respect to item fit, results showed that there were no problematic items, as they all displayed acceptable fit statistics, and, as such, they all performed well at measuring social job-crafting behaviour. However, it is worthy to note that JCS6 ("I ask whether my supervisor is satisfied with my work") showed some signs of DIF amongst age groups, with younger individuals finding this item more difficult to endorse than their older counterparts. The DIF contrast for this item was so trivial that the finding has no real practical implications. The finding does, however, suggest that younger and older employees interpret the item differently, or perhaps differ in the ways they change their work characteristics through social crafting behaviour. Although qualitative in nature, previous research has indeed found that age has an effect on job-crafting behaviour, and that younger and older employees differ in the ways they craft their jobs (El Baroudi & Khapova, 2017; Van den Oetelaar, 2011).

In terms of reliability, and echoing previous findings (Tims et al., 2012), this sub-scale showed good internal consistency and separation for both the persons and items. The sub-scale did well at distinguishing between high and low social job crafters, and the sample did well at distinguishing the hierarchical ordering of the items.

2.5.3.3 Increasing challenging job demands

Rating scale analysis for this dimension showed that all the categories functioned well according to Rasch model expectations. Despite Category 1 being scarce in its selection, all five categories produced acceptable fit statistics, category measures, and Andrich thresholds across the rating scale, and the construct map showed that the categories did well at targeting the job-crafting behaviour of the respondents with respect to this dimension. Taking the items into consideration, initial observations of the ICCs flagged JCS16: "When there is not much to do at work, I see it as an opportunity to start new projects" as potentially problematic. However, the item fit statistics did not support the item misfit. According to the item fit statistics, all five items performed well under Rasch model specifications, where all the items displayed satisfactory fit.

In relation to reliability, the *Increasing challenging job demands* dimension showed good internal consistency. The person separation, however, was slightly lower than desired, suggesting that the scale did not do well at distinguishing between high and low job crafters with respect to this dimension (Linacre, 2016a). This may have been due to the low frequency count of Category 1, making it difficult to obtain accurate measures of individuals who are display low levels of this form of job-crafting behaviour. In terms of the item reliability and separation, the sample did well at determining the hierarchical ordering of the items. This implies that, should this sub-scale be administered to a similar sample in the future, there is a high probability that the items will function in the same way (Linacre, 2016a).

Lastly, with regard to DIF, JCS13 ("I regularly take on extra tasks even though I do not receive extra salary for them") and JCS19 ("I try to make my work more challenging by examining the underlying relationships between aspects of my job") displayed signs of bias across genders. With regard to JCS13, men found this item more difficult to endorse than women did, and the finding was both practically and statistically significant. Conversely, with regard to JCS19, women found this item more difficult to endorse than men did, and the finding was both practically and statistically significant. Based on these observations, it is clear that these two

items are interpreted differently by men and women, and, thus, it is recommended that these two items be set aside in future studies that wish to identify gender differences with respect to this job-crafting dimension.

2.5.3.4 Decreasing hindering job demands

Inspection of the category fit statistics, category measures, and Andrich thresholds showed that there was proper category functioning for this dimension. Although the categories produced acceptable fit statistics and were well-ordered across the latent construct, there were signs of person mistargeting for those individuals who display low levels of *Decreasing hindering job demands*. The construct map showed that there was some information (between -1 and -2 logits) on the latent continuum that was not targeted by the categories (or items), suggesting that additional categories or items should be included to effectively capture the entire construct of interest (Linacre, 2016a; Wilson, 2005).

With regard to the items, inspection of the ICCs flagged JCS8 ("I try to ensure that I do not have to make many difficult decisions at work") as potentially problematic. This was quite intriguing, as this item also produced the lowest factor loading in the development of the JCS (Tims et al., 2012). Despite this, the fit statistics showed all items to fit Rasch model expectations, and, as such, there were no problematic items. This was further supported by the fact that all the items showed to work invariantly across age groups and gender. As far as reliability is concerned, the dimension showed good internal consistency and item reliability, but, again, the person separation was slightly lower than desired.

2.5.4 Practical Implications and Contributions

The findings produced by this research have practical implications. For example, the study showed it is best to work with equal-interval or linear measurement, as this leads to more accurate statistical conclusions. The study also emphasises the need for researchers and scale developers to pay special attention to the design of their response formats when measuring a particular behaviour of interest. Sometimes, providing individuals with too many response options leads to inconsistent responses, due to the redundant nature of the categories (Bond & Fox, 2007), or, as in the present study, the overutilization of the upper or lower categories. In a similar vein, researchers need to be cognisant of item content or wording in the developmental stages of their research instruments. As the present study showed, it is not uncommon for items to carry conceptual differences between sub-groups (e.g., age and gender), or for items to be

vague or ambiguous in their description. As a whole, the present study shows that new modern psychometric approaches are available that allow one to investigate, in depth, the psychometric properties of existing measurement scales.

2.5.5 Limitations and Recommendations for Future Research

The present study was not immune to limitations. The self-report nature of the research is the first limitation of the study. It is not uncommon for individuals to practise impression management or provide misinformation when completing self-reports on their own behaviour (Tedeschi & Reiss, 1981), especially when the behaviours being monitored are perceived as negative by others. With regard to self-undermining behaviour, in particular, it may be useful to obtain co-worker or supervisor ratings in future, to gain more objective and accurate measures of employees' self-undermining behaviour. This may answer the calls that have been made by researchers to obtain other ratings (i.e. supervisor and co-worker ratings) of counterproductive or deviant forms of organisational behaviour (Fox, Spector, Goh, & Bruursema, 2007; Stewart, Bing, Davison, Woehr, & McIntyre, 2009). Furthermore, the advice of Berry, Carpenter, and Barratt (2012) was followed in the present study, that researchers should take note that, in order to elicit more accurate and truthful responses of respondents' counterproductive work behaviour (e.g., self-undermining), more proactive measures and seriousness needs to be taken to ensure the anonymity and confidentiality of respondents to provide them with the confidence needed to report on their self-undermining behaviour. This advice should be heeded by other researchers in future studies. Another limitation of the research pertains to the sample. The sample comprised working individuals from the South African population only; therefore, caution should be taken in generalising the findings across international boundaries.

In terms of recommendations for future research, it is recommended that future Rasch studies be conducted on the proposed instruments to confirm the findings reported in this paper. Given that the study was limited to the South African working population, it may be useful corroborating these findings (i.e. misfitting items) in other international contexts, with different samples. Furthermore, this study pointed out that DIF or item invariance was present for some of the items. As such, future researchers (specifically those in South Africa) who intend using the Self-Undermining Scale, JCS, or JCQ should exercise caution in computing mean score comparisons for age and gender, as some of the items may carry different meanings for these

sub-groups. Therefore, DIF tests should be conducted prior to any inferential statistical conclusions being made.

2.5.6 Conclusion

The Rasch measurement model allows one to examine, in depth, the psychometric properties of existing measurement instruments and, as such, is a useful tool for researchers and practitioners operating in the behavioural and social sciences who wish to study human behaviour in the workplace. As the present study showed, the Rasch model can be used to investigate rating scale functionality, item performance, and the reliability of an instrument, to name a few. Through Rasch model applications, more robust measurement instruments can be constructed, which would yield more accurate and reliable research findings.

Publication Notice

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CHAPTER 3:

THE INFLUENCE OF PERSONALITY ON JOB PERFORMANCE THROUGH JOB CRAFTING AND SELF-UNDERMINING BEHAVIOUR: AN SEM APPROACH

ABSTRACT

Whereas ample research has investigated the direct personality–performance relationship, the current study investigated the indirect relationship between personality and performance through two specific employee behaviours, namely job crafting and self-undermining. Job crafting regards to the proactive changes employees make to their task, relational, and cognitive job boundaries, while self-undermining is a consistent pattern of undesirable workplace behaviours that hinder employee job performance. The study employed a quantitative cross-sectional research design (n = 580) and SEM to investigate the research hypotheses. Results showed that each of the Big Five personality traits indirectly affect job performance (in-role behaviour, organisational citizenship behaviour toward individuals) through job crafting behaviour. In terms of self-undermining, of the three traits that make up the Dark Triad (Machiavellianism, psychopathy, narcissism), only psychopathy showed to indirectly affect job performance (CWB towards individuals; CWB-I) through self-undermining behaviour when analysed as separate traits. Interestingly, when measured as a total 'dark core' or higher-order construct, the Dark Triad indirectly affects counterproductive work behaviour (CWB-I) through self-undermining behaviour. The study contributes to the limited knowledge surrounding the individual antecedents of job crafting and self-undermining behaviour, and illustrates how individuals' predisposition can influence their workplace behaviours and subsequent job performance. It also sheds light on the measurement of the Dark Triad in a non-Western context.

Keywords: Big Five, Dark Triad, job crafting, self-undermining, job performance

3.1 INTRODUCTION

Of all the possible work-related outcomes, job performance is conceivably one of the most valued (*cf.* Tims, Bakker, & Derks, 2014, p. 490), since it affects the survival, functioning, and overall bottom-line of the organisation (Campbell, 1990). Rotundo and Sackett (2002) proclaim that part of the reason why extensive research has been carried out in the job-performance domain stems from the idea that job performance is highly sought-after and valued, both by managers and organisations alike. In fact, it has been said that the measurement and analysis of job performance plays a critical role in realising the goals of the organisation (Popova & Sharpanskykh, 2010). Thus, in order to maintain a competitive advantage, deal with constant globalisation challenges, and ultimately secure the long-term success of the organisation, which are examples of common organisational goals, it is not only essential that the performance of employees are efficiently monitored and handled, but that the antecedents of performance are well understood.

A significant body of research on the antecedents of job performance has been published (see Abdul Rashid, Sambasivan, & Johari, 2003; Bakker, Demerouti, & Verbeke, 2004; Gould-Williams, 2003; Shanock & Eisenberger, 2006; Wang, Law, Hackett, Wang, & Chen, 2005). What is noticeable amongst these studies, however, is that they primarily focused on contextual or situational factors (e.g., supervisor support, organisational culture, trust, leader–member exchange) as predictors of job performance. Owing to pioneering work in the field (Barrick & Mount, 1991; Salgado, 1997; Tett, Jackson, & Rothstein, 1991), attention has slowly begun to shift from focusing solely on contextual or organisational factors to focusing more on the dispositional characteristics (e.g., needs, preferences, and interests) of the individual who is responsible for performing the job. One particular avenue that has emerged as showing prospects in explaining individual differences in job performance is personality, or the individual's characteristic way of thinking, feeling, and behaving (Funder, 2001; Pervin, Cervone, & John, 2005).

Personality pervades our everyday life, and its effects are widespread, influencing individuals' career choices (Costa, 1996; Furnham, 1997), working styles (Hoekstra, 1993), work engagement levels (Woods & Sofat, 2013), and their ability to react to and interact with others (De Janasz, Dowd, & Shneider, 2002). Since the resurgence of personality psychology in the early 1990s, personality at work has become a topic of considerable research interest (De Fruyt

& Salgado, 2003). A wealth of research studies that explored personality and its effects on important organisational outcomes, such as employee attitudes (e.g., Palaiou, Zarola, Furnham, 2016), person–job fit (e.g., Ehrhart, 2006), and job performance (e.g., Lado & Alonso, 2017) are being published in major academic and organisation journals. Despite early behaviourists such as Mischel (1968) and Peterson (1965) advocating the non-significant role of personality in predicting human behaviour (*cf.* Hogan & Roberts, 2001), the steady rise in personality research over the past few decades suggests otherwise.

Previous studies have yielded important information regarding the personality–performance relationship (Bell, 2007; Bozionelos, 2014; Judge & Illies, 2002; Lado & Alonso, 2017; Tett et al., 1991). Earlier meta-analytic findings, for example, show that some personality traits, such as extraversion and agreeableness, are important for successful job performance in occupations that require social interaction (Barrick & Mount, 1991). These findings were further supported in later studies (Mount, Barrick, & Stewart, 1998; Salgado, 1997). Most recently, Oldham and Fried (2016) conducted a review of early job design research and theory, and came to the general consensus that employees respond differently to their job characteristics as a function of their personalities. Although extant research has established that a relationship does indeed exist between personality and performance, less is known about the behavioural processes through which this relationship unfolds. Previous research predominantly looked at the direct personality–performance relationship, with little attention being given to the indirect ways in which personality may affect performance through different workplace behaviours. Concurring with the notion that personality is an indirect determinant (Johnson & Schneider, 2013), I propose that two workplace behaviours, namely job crafting and self-undermining, mediate the personality–performance relationship. That is, I believe that employees engage in job crafting and self-undermining as a result of their underlying personality traits, which, in turn, affect how they perform.

Job crafting, a promising workplace strategy that employees can use to increase their work-related well-being (Tims, Bakker, & Derks, 2015), is a proactive form of employee behaviour that involves making changes to the physical and cognitive boundaries of one's job (Wrzesniewski & Dutton, 2001). Employees are said to be engaged in job crafting when they physically change the manner in which they perform the job (e.g., increasing or decreasing the amount of social interaction with co-workers) and mentally change the manner in which they perceive the job (e.g., seeing the job as an integral part of the organisation, as opposed to 'just

a job'). Self-undermining, on the other hand, is regarded as a consistent pattern of undesirable workplace behaviours that negatively hinder the job performance and well-being of employees (Bakker, 2014; Bakker & Costa, 2014). Examples of behavioural self-undermining include creating conflict with co-workers, creating a backlog in work tasks, wasting time, and persistently making mistakes (Bakker & Wang, in press).

Given that job crafting and self-undermining have important implications for employee well-being and performance (Bakker, 2015; Bakker & Wang, in press; Gordon, Demerouti, Le Blanc, & Bipp, 2015; Tims, Bakker, & Derks, 2015; Weseler & Niessen, 2016), it is imperative that organisations understand the factors that drive or predict such behaviours. In contrast to their work-related outcomes, there is a dearth of research surrounding the individual antecedents of job crafting and, especially, self-undermining behaviour. With regard to job crafting, calls have been made to examine the personal conditions or antecedents that encourage or promote job crafting behaviour (Oldham & Fried, 2016; Vogt, Hakanen, Brauchli, Jenny, & Bauer, 2016; Wrzesniewski & Dutton, 2001). As far as self-undermining is concerned, the construct has only recently been introduced into the organisational behaviour literature (see Bakker, 2015; Bakker & Costa, 2014; Bakker & Wang, in press), and, as such, its antecedents remain unexplored.

Using a series of structural equation models, the aim of the present research was to explore individuals' personality traits as antecedents of job crafting and self-undermining behaviour, together with their subsequent implications for job performance. In particular, the study investigated 1) the indirect relationships between each of the Big Five personality traits (extraversion, agreeableness, conscientiousness, openness, neuroticism) and job performance (in-role behaviour, organisational citizenship behaviour) through two forms of job crafting behaviour (task crafting, relational crafting); and 2) the indirect relationships between each of the Dark Triad personality traits (Machiavellianism, psychopathy, narcissism) and job performance (counterproductive work behaviour) through self-undermining behaviour. Figures 20a and 20b provide a general overview of the two hypothesised research models.

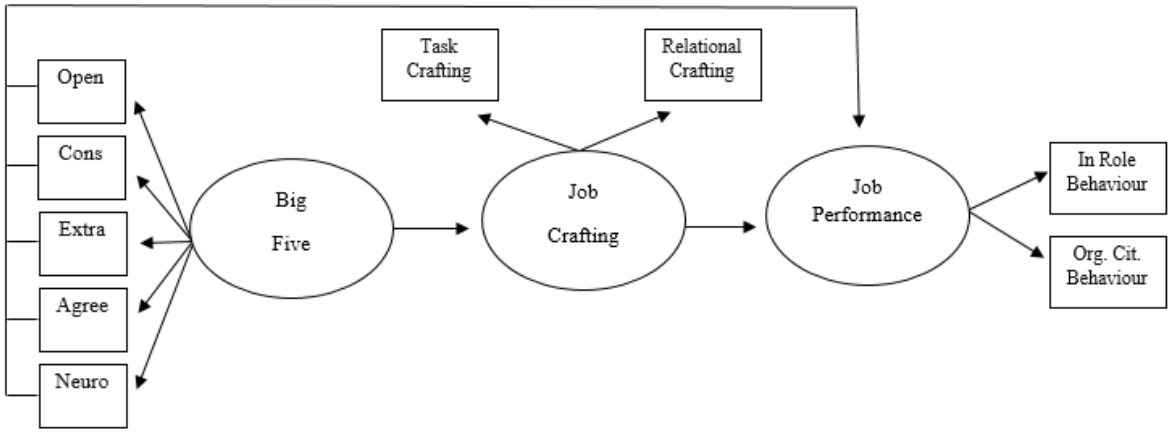

Figure 20a. Hypothesised 'bright' model

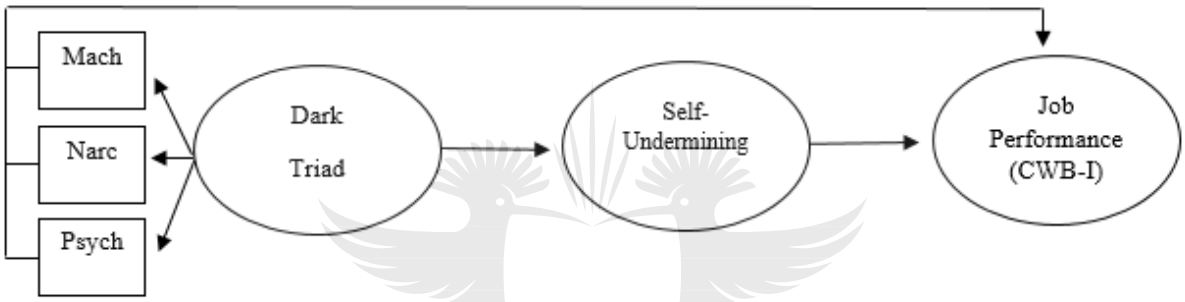

Figure 20b. Hypothesised 'dark' model

3.2 LITERATURE REVIEW

3.2.1 Conceptualising Personality

Of all the words in the English dictionary, *personality* is possibly one of the most abstract, because it cannot be directly measured, yet is inferred from various overt and covert behaviours (McCrae & Costa, 1997). The multidimensional nature of it, the lack of its physical presence, the innumerable characteristics used to describe it, and the various competing theoretical models often lead to one grappling with its definition. Funder (2001) simply defines personality as the individual's characteristic way of thinking, feeling, and behaving, while Allport (1937), offering a somewhat more intricate definition, refers to it as "the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to the environment" (p. 48). Despite their nuances in interpretation, both these definitions have in common the fact that personality affects behaviour in the form of how individuals think and feel, and in how they adjust to their environments.

From a trait perspective, personality comprises a number of specific traits, which are the enduring and stable dispositions or tendencies of individuals to behave consistently across situations (McCrae & John, 1992). Stated otherwise, traits are the basic building blocks that make up an individual's personality (McCrae & Costa, 1997). Traits can also be viewed as behavioural indicators of an individual's personality (James & Mazerolle, 2002). For example, when an individual behaves in a social, talkative, and energetic manner, he or she are commonly said to possess high levels of the trait *extraversion*. According to James and Mazerolle (2002), personality traits can range on a continuum, whereby an individual displays either very high or very low levels of the specific trait. Trait activation theory (Tett, Simonet, Walser, & Brown, 2013), a theory of personality and performance, holds that individuals' traits become activated when they are presented with trait-relevant situational cues. The theory advocates that individuals act and react differently in given situations as a result of their underlying personality traits. Therefore, whether individuals choose to engage in job crafting or self-undermining may be a function of their inherent predisposition to act or behave in a certain way. One situation in particular that may prompt individuals to express their personality traits is the work context.

3.2.1.1 Personality at work

Although it cannot be seen physically, because it is inherently psychological (Christiansen & Tett, 2013), the manifestations of personality are everywhere, including the workplace. In order to maximise organisational outcomes, we need to have some understanding of the individuals (Hogan, 2004), which essentially requires some understanding of their personality. Christiansen and Tett (2013) advise that understanding personality is integral to understanding why employees behave the way they do at work. It is not surprising that organisations, in the current century, turn to and heavily rely on personality assessments to weed out undesirable job candidates. In fact, approximately 80% of the Fortune 500 companies are said to employ personality assessments for purposes that include, but are not limited to, recruitment, selection, and training (Datner, 2008).

Since the 1990s, research on personality and its effects on important organisational outcomes has increased significantly. Several lines of evidence suggest that personality plays an important role in explaining the behaviours individuals engage in at work. For example, findings have shown that individuals' personality unfolds in the form of how they approach

their work (Hoekstra, 1993), the social relationships they engage in (Jensen-Campbell, Knack, & Rex-Lear, 2009; De Janasz et al., 2002), the extent to which they are satisfied with their jobs (Judge, Heller, & Mount, 2002), and, most importantly, how they perform (Barrick & Mount, 1991; Salgado, 1997; Tett et al., 1991; Williams & Anderson, 1991). Collectively, these studies indicate that it is essential to take into consideration an individual's personality when attempting to explain or understand the behaviours he or she engages in at work.

The growth in personality research over the past few decades is indebted to sound personality taxonomies that have been developed through rigorous lexical studies (e.g., Goldberg, 1981; John, 1990). A taxonomy refers to a particular concept that has been systematically classified to form a series of ordered groups or categories (Saucier & Goldberg, 2003). When conducting personality research, it is imperative to work from a well-established taxonomy, as it provides a nomenclature or common language that enables researchers to accumulate and communicate their empirical findings (John & Srivastava, 1999). According to McCrae and John (1992), "without a comprehensive personality model, studies using personality traits as predictors are inconclusive, because the most relevant personality traits may have been overlooked" (p. 206). Other researchers have also emphasised the importance of theory-driven approaches to conducting personality research, particularly research concerning the personality–performance relationship (e.g., Hogan & Holland, 2003; Hurtz & Donovan, 2000). Accordingly, before the personality–performance relationship and hypothesised mediational processes are elucidated, two taxonomies of personality are discussed, namely the Five-Factor Model and the Dark Triad, which were used in the current research.

3.2.2 The Five-Factor Model

The Five-Factor Model (FFM) (Tupes & Crystal, 1961) measures five personality traits, commonly referred to as the *Big Five* (Goldberg, 1990), and is a hierarchical organisation of personality whose structure is considered universal (McCrae & Costa, 1997; McCrae & John, 1992). In fact, several lexical studies investigating countless adjective trait terms have confirmed and supported the robustness and generalisability of the five-factor structure across languages, cultures, and ratings sources (see Goldberg, 1990; McCrae & Costa, 1997; Norman, 1967; Tupes & Christal, 1961). The general acceptance of the FFM has revived the area of personality psychology, and has facilitated much progress in personality research within applied areas such as industrial and organisational (I/O) psychology (Furnham, 2003; James &

Mazerolle, 2002; Johnson & Schneider, 2013). Of all the personality taxonomies available in the literature, the FFM seems to be the most parsimonious and the one that best describes the most pertinent aspects of personality, the 'bright side' of personality, that is.

Five factors are subsumed with the FFM, each of which comprises several intercorrelated traits or facets (McCrae & Costa, 1997). The Big Five are: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experiences. Individuals with high extraversion are energised by social interactions and are generally viewed by others as outgoing, social, friendly, talkative, and fun loving (McCrae & Costa, 1987). Their enthusiasm is visible, and they are more likely to experience positive emotions and enjoy the company of others (Nel, Valchev, Rothmann, Van de Vijver, Meiring, & De Bruin, 2012). Agreeable individuals tend to be nurturing, caring, emotionally supportive, trustful, and good-natured (Digman, 1990; John & Srivastava, 1999). They are generally compliant, generous, kind, sympathetic, and co-operative toward others (McCrae & Costa, 1987; McCrae & John, 1992). Those on the opposite end of the agreeableness spectrum display tendencies of self-centeredness, jealousy, spitefulness, scepticism, and callousness, and may come across as stubborn and rude (Digman, 1990). Conscientiousness, or what Digman and Takemoto-Chock (1981) call 'will to achieve', is an achievement-orientated trait characterised by the tendency to be punctual, hard-working, well-organised, careful, and thorough (Colbert, Mount, Harter, Witt, & Barrick, 2004). These individuals are generally productive, self-disciplined, dependable, responsible, persistent, and display a strong sense of direction (McCrae & Costa, 1987), while those low on the trait tend to be careless, irresponsible and disorderly (John & Srivastava, 1999). Neuroticism, or low emotional stability, is probably the trait with the least controversy surrounding its definition. It refers to the tendency to experience negative emotions and the disturbed thoughts and behaviours that come along with these (McCrae & Costa, 1987). Highly neurotic individuals are generally stressed, anxious, impulsive, and vulnerable (Ones & Viswesvaran, 2001), and, as a result, display ineffective coping and poor emotional-adjustment strategies (Judge & Ilies, 2002; McCrae & Costa, 1987). Their negative and temperamental nature finds them experiencing a host of negative emotions and moods, ranging from nervousness and self-consciousness to insecurity and depression. The fifth and final trait is openness to experience, or what is also known as *intellect*, *culture*, or *creativity* (*cf.* Digman, 1990), and it refers to the tendency to be aesthetically sensitive, creative, open-minded and cultured, and these individuals like to explore and see new things. Individuals with

high levels of openness are original, have wide-interests and imaginations, and display unusual thought processes (McCrae & John, 1992).

Apart from affecting the everyday thoughts and behaviours of individuals, research has demonstrated the usefulness of the Big Five within the world of work. Research on leaders, for example, has shown that some Big Five traits (i.e. extraversion and agreeableness) are important from a transformational leadership perspective (Judge & Bono, 2000). Meta-analytic findings have also shown that the Big Five, as a set of personality traits, influence the extent to which individuals are satisfied with their jobs (Judge et al., 2002). In an earlier study by De Fruyt and Mervielde (1997), the Big Five were found to relate to Holland's (1997) vocational interests, suggesting that personality also influences individuals' preferences for certain career choices. In particular, extraversion, neuroticism, agreeableness, and conscientiousness were found to positively relate to Holland's (1997) Enterprising Scale; extraversion, openness, and agreeableness were found to positively relate to Holland's (1997) Social Scale; openness was found to positively relate to Holland's (1997) Artistic Scale; and conscientiousness showed the strongest positive relationship with Holland's (1997) Conventional Scale.

While personality, as explained by the FFM, has shown to relate to positive work-related outcomes, not all personality traits show such associations. Some employees have destructive intentions and do not necessarily have the organisation's best interests at heart. Characterised by deceit and manipulation, these individuals possess what is called *dark* personality traits that may carry negative implications for the workplace. According to some researchers (Ashton & Lee, 2007; Paunonen & Jackson, 2000), the FFM is limited in that it fails to account for the full range of existing personality traits, and, in particular, it does not consider traits that are socially malevolent or aversive (*cf.* Veselka, Schermer, & Vernon, 2012). The Dark Triad remedies this shortcoming, and is discussed below.

3.2.3 The Dark Triad

One taxonomy of personality in particular that has been used to capture the so-called 'dark side' of human nature is the Dark Triad (Paulhus & Williams, 2002). The Dark Triad is a collection of three socially aversive personality traits, namely Machiavellianism, narcissism, and psychopathy, that all represent a common core interpersonal nature of callousness and manipulation (Wai & Tilipoulos, 2012). The Dark Triad is considered a set of second- or higher-order constructs that underlie more basic personality traits (Jakobwitz & Egan, 2006;

Pailing, Boon, & Egar, 2014). Previous research has found the three dark traits to substantially correlate and share a lot of overlapping information (Lyons & Brockman, 2017; Muris, Merckelbach, Otgaar, & Meijer, 2017; Pailing et al., 2014), with some going so far as to measure the Dark Triad as a single dark core (e.g., Bertl, Pietschnig, Tran, Stieger, & Voracek, 2017; Jonason, Li, & Teicher, 2010). While some researchers have argued that the three dark traits can be used interchangeably in normal samples (e.g., McHoskey, Worzel, & Syzarto, 1998), others contend for the conceptual distinctiveness and treatment of the three dark traits (Furnham, Richards, & Paulhus, 2013; Paulhus & Williams, 2002).

Machiavellianism, named after the famous Italian writer and diplomat Niccolò Machiavelli, is characterised by manipulation, cynicism, self-beneficial motives, and immoral beliefs (Deshong et al., 2015). Individuals with high *Machiavellianism* display no emotional attachment, which often results in them exploiting others through dishonest and deceptive strategies, from which they subsequently derive pleasure (Spain, Harms, & LeBreton, 2014). *Narcissism* is characterised by grandiosity, entitlement, and an inflated view of self (O'Boyle et al., 2012). Narcissists fantasise about success, admiration and exercising control over others, and desire their self-love to be reinforced by significant others (Deshong et al., 2015). In the short term, they may come across as nice and charming, but, in the long run, they experience difficulty in maintaining successful interpersonal relationships, due to their lack of trust and care for others (Spain et al., 2014). The third and final trait that makes up the Dark Triad, which has been considered the most malevolent of them all (Rauthmann, 2012), is *Psychopathy*. This trait is characterised by impulsivity and thrill-seeking behaviour, along with low anxiety and empathy (Hare, 1985; Paulhus & Williams, 2002). This dysfunctional personality trait has been linked to parasitic lifestyles, criminal activities, and shallow emotions (Hare & Neumann, 2009). Babiak and Hare (2006), who co-authored the well-known novel *Snakes in suits: When psychopaths go to work*, note that individuals with high psychopathy are harmful to professional relationships, and their sense of entitlement is likely to result in conflict and rivalry with co-workers. The authors add that individuals with highly psychopathic traits repeatedly engage in dysfunctional behaviours, and are known to disregard organisational rules and regulations and go against what is commonly seen as the norm (Babiak & Hare, 2006).

According to researchers, of the three traits that comprise the Dark Triad, Machiavellianism is most likely a result of experience or environmental influences, whereas psychopathy and

narcissism are more associated with differences in individuals' genes (i.e. they are biologically derived) (Furnham, Richards, Paulhus, 2013; Jones & Paulhus, 2011).

Regardless of their determinants, the Dark Triad has shown to predict a number of social and antisocial behaviours (Atari & Chegeni, 2016), including violence, aggression, and bullying behaviour (Baughman, Dearing, Giammarco, & Vernon, 2012; Pailing, Boon, & Egan, 2014). A recent study investigated the relationship between the Dark Triad and emotional expressivity, and found that psychopathy was a significant predictor of feeling sad or fearful after watching a happiness-evoking video clip (Lyons & Brockman, 2017). That is, individuals who scored high on *Psychopathy* would feel sad or fearful after watching something that was meant to elicit positive emotions.

The preceding two sections dealt with the FFM and the Dark Triad as two taxonomies of personality that may help explain the bright side and dark side of human nature respectively. In the sections that follow, I introduce the concept of job performance as the dependent variable of the study and, based on previous research, hypothesise the various relationships it has with the FFM and the Dark Triad respectively. Thereafter, I introduce job crafting and self-undermining as mediating variables that may help explain the indirect relationships between personality and performance.

3.2.4 Job Performance

Both the FFM and the Dark Triad, as taxonomies of personality, have been used to explain individual differences in job performance (e.g., Barrick & Mount, 1991; Rothman & Coetzer, 2003). As a concept, *job performance* refers to the actions or behaviours that individuals engage in at work that contribute toward the overall goals of the organisation (Campbell, 1990). Rothman and Coetzer (2003) define job performance as the initiative and resourcefulness employees display in completing their job tasks and solving work-related problems, as well as the efficiency with which they fulfil such responsibilities. While previously it was said that the domain of job performance lacked a sound theoretical framework (see Campbell, 1990), the accumulation of research findings over the years has led to the general consensus that job performance is a multidimensional construct consisting of three distinct groups of behaviour that each independently contribute to overall job performance, namely task performance, contextual performance, and counterproductive work behaviour (Borman & Motowidlo, 1997;

Koopmans, Bernaards, Hildebrandt, Schaufeli, De Vet, & Van der Beek, 2011; Motowidlo, Borman, & Schmit, 1997; Motowidlo & Van Scotter, 1994; Rotundo & Sackett, 2002).

Task performance, also known as *in-role behaviour* (IRB) (Williams & Anderson, 1991), refers to behaviours that are role-prescribed (Katz & Kahn, 1978), sanctioned, and formally recognized and rewarded by the organisation. These behaviours are stipulated in the incumbent's job description, and are necessary for the day-to-day functioning of the organisation. According to Motowidlo and Van Scotter (1993), *task performance* refers to behaviours that transform raw materials into the goods and services produced or offered by the organisation. Formally stated, these involve the execution of technical processes that contribute to the organisation's technical core (Motowidlo & Van Scotter, 1993). Examples of task performance for a salesperson may include closing a business deal, possessing adequate product knowledge, and effectively managing his or her time (*cf.* Organ, Podsakoff, & Podsakoff, 2011).

On the other hand, when an individual goes beyond what is required by the job, we say he or she is engaged in contextual performance, or what others regard as organisational citizenship behaviour (OCB) or extra-role behaviour (Organ, 1988; Williams & Anderson, 1991). Contextual performance, or OCB, is defined as those voluntary actions or activities that are not recognized by the formal reward system, yet they shape the organisational, social, and psychological context, which promotes the efficient and effective functioning of the organisation (Organ, 1988; Organ et al., 2011). There are two forms of OCB: those targeted toward a specific individual, co-worker or supervisor (OCB-I) and those that are more impersonal in nature, and which benefit the larger organisation (OCB-O) (Organ et al., 2011). Examples of OCBs include volunteering to take on additional work not part of the formal job requirements, helping and co-operating with others, and demonstrating conscientiousness in support of the organisation (e.g., saying good things about the organisation to outsiders) (Borman & Motowidlo, 1997). Some have considered contextual performance as more valuable than task performance, due to its larger motivational and interpersonal implications (see Motowidlo and Van Scotter, 1994). Task performance is said to be better predicted by an individual's knowledge, skill, ability, and the design of the larger system in which the individual operates. Contextual performance is most likely predicted by dispositional factors such as an individual's personality (Borman & Motowidlo, 1997; Motowidlo & Van Scotter, 1994; Organ et al., 2011). The rationale is that task activities vary considerably across jobs,

while contextual activities are more similar across jobs (e.g., helping behaviour). As put forth by Hogan and Holland (2002), non-task performance or contextual performance is important in all types of jobs.

The final dimension to make up the job performance domain is counterproductive work behaviour (CWB). CWBs are behaviours that harm or are intended to harm others or the organisation, and include acts that run counter to the organisation's interests (Sackett & DeVore, 2002; Spector & Fox, 2005). CWB can be viewed as one of the most costly and damaging forms of organisational behaviour (*cf.* Cohen, 2016). In fact, Govoni (1992) argues that cases of employee theft (a form of CWB) have resulted in losses that may exceed $200 billion annually amongst American businesses. Like OCB, CWBs can be targeted toward a particular person (CWB-I) or toward the larger organisation (CWB-O), and can range from mild (e.g., using the Internet for non-work-related purposes) to more severe cases (e.g., theft, sabotage). Apart from harming the individual and the organisation, CWBs can also undermine relationships at work (O'Boyle, Forsyth, & O'Boyle, 2011).

3.2.4.1 The FFM and job performance

Given its unrivalled robustness and strong generalisability, the FFM is most-often used amongst personality researchers when explaining individual differences in job performance. Previous meta-analytic findings using the FFM have consistently shown that there is a positive relationship between the Big Five (with the exception of neuroticism) and job performance (e.g., Barrick & Mount, 1991; Bell, 2007; Hogan & Holland, 2003; Hurtz & Donovan, 2000; Judge & Illies, 2002; Salgado, 1997; Tett et al., 1991). While there are researchers in the personality–performance domain that advocate that personality constructs have very little validity for performance (e.g., Beaty, Cleveland, & Murphy, 2001; Salgado, 1997), there have been reports of correlations as high as .49 between the Big Five (as a set of personality traits) and performance motivation criteria (i.e., goal-setting, expectancy, and self-efficacy) (e.g., Judge & Ilies, 2002).

Barrick and Mount's (1991) meta-analysis, in particular, greatly contributed to the field of personnel psychology. They investigated the relationship between the Big Five and job performance (i.e. job proficiency, training proficiency, and personnel data) across a range of occupational groups, and found that conscientiousness was the strongest and most consistent predictor of job performance across all occupations. These findings were later mirrored in a

meta-analysis conducted by Salgado (1997) in the European context. Hurts and Donovan (2000), in an attempt to correct for methodological and statistical deficiencies in prior meta-analyses that, according to them, may have underestimated true-score validities of the Big Five (e.g., Barrick & Mount, 1991; Salgado, 1997; Tett et al., 1991), reported similar findings. Specifically, they found estimated true-score validities ranging from .06 to .20 for explicit measures of the Big Five, with *Conscientiousness* again showing the highest estimated true-score validities across occupations.

Taken together, conscientiousness seems to be the most valid predictor of task-oriented performance. This appears logical, as the characteristic tendencies of conscientious individuals (e.g., hardworking, dependable, organised, persistent) all equate to desirable features necessary for optimal task performance. Worthy of noting, however, is that individuals who are extremely conscientious may engage in behaviours that are actually harmful to them and their subsequent job performance, such as workaholism and rigidity (Samuel, Riddell, Lynam, Miller, & Widiger, 2012). Recent findings, for example, have found curvilinear or inverted U-shape relationships between *Conscientiousness* and *Job performance* (e.g., Le, Oh, Robbins, Ilies, Holland, & Westrick, 2011; Wihler, Meurs, Momm, John, & Blickle, 2017), suggesting that too much conscientiousness may actually be detrimental to the functioning of the employee. Despite these interesting findings, the general consensus is that conscientiousness is indeed the most valid predictor of IRB (Barrick & Mount, 1991; Ellershaw, Fullarton, Rodwell, & McWilliams, 2015; Hurtz & Donovan, 2000; Salgado, 1997; Tett et al., 1991). Thus, the following is hypothesised:

Hypothesis 1(a): There is a positive relationship between conscientiousness and in-role behaviour (IRB).

Of the Big Five, extraversion and agreeableness seem to be the most socially-relevant traits, with both these traits being said to define the interpersonal circumplex model (*cf.* McCrae & Costa, 1989). Individuals with high *Extraversion* and *Agreeableness* are warm, kind, friendly, and co-operative, and, consequently, find it easy to get along with others. Not surprisingly, research has found extraversion and agreeableness to be the strongest predictors of performance in occupations involving high social interaction (e.g., Barrick & Mount, 1991; Mount et al., 1998; Salgado, 1997). In a recent meta-analysis of the team-composition literature, agreeableness emerged as one of the strongest predictors of team performance in

field settings (Bell, 2007). The above findings point to the idea that agreeableness and extraversion are more likely to affect the extent to which individuals engage in OCBs, rather than actual task performance. Van Scotter and Motowidlo (1996) and Organ and Ryan (1995) indeed found *Extraversion* and *Agreeableness* to relate more strongly to the interpersonal dimension *Contextual performance* (i.e. OCB-I). Taking their interpersonal inclinations and implications into consideration, is the following is hypothesised:

Hypothesis 1 (b): There is a positive relationship between extraversion and OCB-I.

Hypothesis 1 (c): There is a positive relationship between agreeableness and OCB-I.

Openness to experience, as one of the Big Five traits, has been considered one of the weaker predictors of job performance (*cf.* Griffin & Hesketh, 2004). While there is empirical evidence suggesting a small relationship between openness to experience and job performance (e.g., Barrick & Mount, 1991; Barrick & Mount, 2001), some studies have shown more promising findings. Salgado (1997), for example, reported a meta-analytically derived correlation of .26 between *Openness to experience* and *Job performance* (i.e. training proficiency). Homan and colleagues (2008), who conducted a study amongst highly diversified groups, found that groups who displayed higher levels of *Openness to experience* capitalised on their differences and actually performed better than those with lower levels of *Openness to experience*. Echoing these findings amongst a sample of 393 nurses, Ellershaw et al. (2015) found that increased *Openness to experience* was associated with increased team proficiency. While there may be conflicting views surrounding the relative importance of openness to experience for job performance, I consider it to have some incremental validity in predicting job performance. It is not unreasonable to think that individuals who are open to experiences will perform differently to those who are less open. Since these individuals are curious, imaginative, and open-minded, they may find different means and ways to go about their work, which could have a positive impact on their job performance. Also, because these individuals like to try and experience new things, they may be more likely to engage in behaviours that go beyond what is required of them (i.e. OCBs). I hypothesise the following:

Hypothesis 1 (d): There is a positive relationship between openness to experiences and IRB.

Hypothesis 1 (e): There is a positive relationship between openness to experiences and OCB-I.

Finally, research investigating the influence of neuroticism on job performance has mainly found inverse or negative relationships (e.g., Barrick & Mount, 1991; Rothmann & Coetzer, 2003; Tett et al., 1991). Piedmont and Weinstein (1994), for instance, found that low scores on *Neuroticism* predicted high supervisor ratings of job performance. In a meta-analysis by Kaplan, Bradley, Luchman, and Haynes (2009), a negative relationship was reported between negative affect (the core characteristic of *Neuroticism*) and task performance. Furthermore, they found that negative affect was associated with increases in CWBs. Another recent study investigated the fit between individuals' personality and task demands that required certain trait elevations (Christiansen, Sliter, & Frost, 2014). It was found that individuals who scored high on *Neuroticism* reported all job tasks to be distressing, regardless of whether the task were aligned with their personality traits or not. One can easily make sense of the above findings; highly neurotic individuals often experience negative emotions and the associated disturbed thoughts and behaviours (McCrae & Costa, 1987), resulting in poor and irrational coping strategies and, ultimately, negatively affecting how they perform in their job. Consistent with previous research, the following hypotheses were formulated:

Hypothesis 1 (f): There is a negative relationship between neuroticism and IRB.

Hypothesis 1 (g): There is a negative relationship between neuroticism and OCB-I.

Hypothesis 1 (h): There is a positive relationship between neuroticism and CWB-I.

Although statistically significant correlations have been found between the Big Five personality traits and job performance, it is important to note that the magnitude of these relationships may differ when certain individual or contextual factors are present. For example, Barrick and Mount (1993) found that extraversion, agreeableness, and conscientiousness predicted job performance better when levels of job autonomy were high. That is, when individuals had the freedom to exercise discretion over their job tasks, their personality had a stronger impact on their performance. With respect to individual factors, it has been found that the interaction between cognitive ability and personality explains an incremental 9% of the variance in performance (Wright, Kacmar, McMahan, & Deleeuw, 1995). Another study investigated the moderating effect of empathy on the relationship between personality and OCB-I, and found that agreeableness, conscientiousness, and emotional stability had a positive relationship with performance when levels of empathy were low (Taylor, Kluemper, & Mossholder, 2010).

3.2.4.2 The Dark Triad and job performance

Like the FFM, the relationship between the Dark Triad and job performance is well documented in the literature, for all the wrong reasons, however. Apart from reported acts of violence, aggression, and bullying behaviour (Baughman et al., 2012; Pailing et al., 2014), the Dark Triad has shown associations with various components of job performance. A small number of investigations have reported negative correlations between the Dark Triad and task- or contextual performance (e.g., Judge, LePine & Rich, 2006; Zettler & Solga, 2013); most commonly researched is the relationship between the Dark Triad and CWB (*cf.* DeShong et al., 2015), which is the relationship in which I was particularly interested.

Empirical findings point to the fact that individuals characterised by high scores on the Dark Triad report more cases of CWB. O'Boyle and colleagues (2012), for example, conducted a meta-analysis of the Dark Triad and work behaviour literature, and found that high scores on all three dark traits were associated with increases in CWB. Bennet and Robinson (2000) and Paulhus and Williams (2002) also found a significant amount of variance in CWB to be explained by the Dark Triad. Furthermore, studies amongst working undergraduate students have reported positive correlations between each dark trait and CWB (DeShong et al., 2015; Penney & Spector, 2002). Interestingly, research has also found that the relationship between the Dark Triad and job performance can range in magnitude, depending on the presence of specific contextual and/or individual factors. For example, O'Boyle et al. (2012) and Zettler and Solga (2013) found that authority, organisational culture, and organisational tenure all moderated the relationship between the Dark Triad and job performance. Taken together, individuals who have self-beneficial motives, no emotional attachment, immoral beliefs, a disregard for organisational rules, and who lack trust and care for others are more likely to engage in CWB-I than those individuals who score low on the Dark Triad. Accordingly, the following hypotheses were formulated:

Hypothesis 2: There is a positive relationship between (a) Machiavellianism and CWB-I (b) psychopathy and CWB-I (c), between narcissism and CWB-I (d), and between the Dark Triad (as a total score) and CWB-I.

3.2.5 Job Crafting and Self-undermining

The increasingly complex and changing nature of work, coupled with advances in information technology, have compelled organisations to search for new and innovative ways to improve

employee wellbeing and performance (Tims & Kooij, 2005). Job crafting, a relatively new and exciting construct, has emerged as a strong candidate in this regard. Considered a bottom-up approach to job redesign (Bakker, Tims, & Derks, 2012), job crafting denotes the proactive changes employees make to balance their job demands and job resources with their own personal skills, needs, and abilities (Tims & Bakker, 2010). There are three forms of job-crafting behaviour, namely task-, relational, and cognitive crafting (Wrzesniewski & Dutton, 2001). *Task crafting* refers to physical changes in how the actual job tasks are performed (in the form of their scope, nature, and content). *Relational crafting* refers to physical changes in the amount and frequency of social interaction that one engages in at work, and *cognitive crafting* refers to changes in how one perceives one's job (Wrzesniewski & Dutton, 2001). Whereas proactive behaviours such as job crafting have noticeable benefits for employee wellbeing and performance, self-undermining, conversely, can be crippling for employees and their subsequent job performance.

Self-undermining, a unidimensional construct, is described as "a consistent pattern of undesirable behaviors in the workplace that undermine job performance" (Bakker & Wang, in press, p. 6). Examples of behavioural self-undermining include creating a backlog in tasks, running into problems at work; making mistakes, creating stress, creating conflict, and creating confusion when communicating with others at work (Bakker & Wang, in press). The concept is similar to, yet distinct, from *self-handicapping*, which denotes obstacles or impediments created by individuals in anticipation of failing performance, to preserve their self-esteem and/or perceived competence (Jones & Berglas, 1978). An example is a student who has to write an exam; the student goes out with his or her friends the night before the exam, and then, upon receiving a poor grade for the exam, blames the night out (i.e. the handicap), rather than his or her inability to study, which, in turn, protects his or her self-esteem. According to Bakker and Costa (2014) and Bakker and Wang (in press), *self-undermining* refers to more concrete organisational behaviours, while self-handicapping is context-free and can apply to various life domains (e.g., athletics, academia). In the sections that follow, job crafting and self-undermining are discussed as two potential workplace behaviours that may mediate the relationship between personality and performance.

3.2.6 FFM → Job Crafting → Job Performance

According to Tims and Kooij (2015), the proactive changes employees make to their jobs in the form of job-crafting behaviour may contribute to improved job performance. This is a reasonable assumption, since changing the design of the job to better suit the skills, preferences, and needs of the job holder may lead to an enhanced work experience and, ultimately, better performance. Indeed, research has established a positive relationship between job crafting and job performance across a range of occupations, including teachers (Leana, Applebaum, & Schevchuk, 2009) and healthcare professionals (Gordon, Demerouti, Le Blanc, & Bipp, 2015; Tims, Bakker, Derks, & Van Rhenen, 2013). Tims, Bakker, and Derks (2015), in a recent longitudinal investigation, found that job crafting had a positive indirect relationship with in-role performance through the mediational process of work engagement. These findings were supported by Wesler and Niessen (2016), who found that employees who crafted their work by extending their task and relational boundaries reported higher scores on task performance (self-ratings).

While it is evident that a relationship does indeed exist between job crafting and job performance, it is less clear to which job performance criterion the various forms of job-crafting behaviour relates most strongly. I anticipated that task crafting would relate positively to task performance (i.e. IRB), as individuals who change the physical design of their jobs through task-crafting behaviour should experience a better fit between their personal characteristics and the characteristics of the job itself, which will aid them in completing their in-role activities more proficiently. Individuals who score high on *Task crafting* are also more likely to find new and creative ways of carrying out their work tasks, which could result in better task performance. In terms of relational crafting, it was expected that there would be a positive relationship between *Relational crafting* and *OCB-I*. Individuals who score high on *Relational crafting* enjoy engaging in interpersonal interactions with others while performing their work, and are thus more likely to engage in helping behaviours, filling in for ill colleagues, and taking on extra workload for those that they have previously established relationships with through relational crafting behaviour. Finally, individuals who score high on *Cognitive crafting* were expected to perform better in their IRB and OCB-I than those who score low. Through cognitive crafting, individuals redefine the purpose of their work and subsequently derive more meaning from it (Tims, Bakker, & Derks, 2016; Wrzesniewski & Dutton, 2001). This increased meaningfulness sparks a desire within individuals to persist and give their all at work,

ultimately having a positive impact on their task performance (IRB). Furthermore, individuals who craft their work cognitively are also more likely to help those around them and speak well of their organisation, since they find that their job makes a meaningful contribution in the greater scheme of things. Taken together, is the following is hypothesised:

Hypothesis 3: (a) There is a positive relationship between task crafting and IRB; (b) there is a positive relationship between relational crafting and OCB-I; (c) there is a positive relationship between cognitive crafting and IRB; and (d) there is a positive relationship between cognitive crafting and OCB-I.

Extensive research has established the outcomes of engaging in job-crafting behaviour, with improved job performance being one of the most salient. There, however, remains a paucity of empirical investigations on the individual antecedents of job-crafting behaviour. As stated by Berdicchia, Nicolli, and Masino (2016), the role that individual differences play in promoting or demoting job-crafting behaviours are still relatively unexplored. Previous research has mainly focused on contextual factors (i.e. work discretion, supervision, and task interdependence) as predictors of job-crafting behaviour (see Ghitulescu, 2006; Leana et al., 2009), with only a few attempts having been made to explore individual antecedents. For example, Tims et al. (2015) found that individuals' intentions to craft, as well their work engagement levels, predicted actual job-crafting behaviour. Other theoretical arguments concerning the antecedents of job crafting have also been made. Demerouti (2014), for instance, proposed that individuals engage in job-crafting behaviour to attain work goals, to create better (healthier) working conditions for themselves and to improve their overall person–environment fit, while Wrzesniewski and Dutton (2001) state that employees craft to fulfil their basic psychological needs (i.e. need for control, need for a positive self-image, and the need for human connection with others).

The present study proposes that personality, as measured according to the Big Five, predicts individuals' job-crafting propensities, which, in turn, affect how they perform. That is, job crafting acts as a mediator or causal link between the Big Five traits and job performance. Both job crafting (Wrzesniewski & Dutton, 2001) and job performance (Campbell, 1990) are regarded as actions, and since personality affects the actions of individuals (McCrae & Costa, 1992), it makes theoretical sense to expect personality to influence the way in which employees craft their work and, ultimately, how they perform. While the personality–performance

relationship is well documented in the literature, research concerning the predictive validity of personality for job-crafting behaviour remains largely understudied. Interestingly, a study by Bakker, Tims, and Derks (2012) found that individuals with a proactive personality were more likely to craft their work than their more passive counterparts. Most recently, and contrary to some of their expectations, Bell and Njoli (2016) found openness to experiences, neuroticism, conscientiousness, and agreeableness to be significant predictors of job-crafting behaviour.

Like with the various dimensions of job performance, I believe that some of the Big Five personality traits are more strongly related to specific job-crafting behaviours than others. Specifically, I expect that the social traits extraversion and agreeableness will relate most strongly to relational crafting, since individuals displaying these traits have the tendency to be talkative, outgoing, affectionate, kind, and warm (John & Srivastava, 1999), which are all necessary to form and sustain healthy relationships and to craft one's relational boundaries. According to Ozer and Benet-Martínez (2006), the strength and quality of relationships are influenced by the dispositions of individuals, and, therefore, it is plausible to argue that the likelihood of individuals engaging in social interaction with their co-workers is influenced by their levels of the traits extraversion and agreeableness. Taken together, is the following is hypothesised:

Hypothesis 4 (a): Extraversion and agreeableness are positively related to relational crafting; (b) Relational crafting mediates the relationship between extraversion and OCB-I, or, stated otherwise, extraversion has an indirect positive relationship with OCB-I through relational crafting behaviour; (c) Relational crafting mediates the relationship between agreeableness and OCB-I, or, stated otherwise, agreeableness has an indirect positive relationship with OCB-I through relational crafting behaviour.

With regard to *Conscientiousness*, it was expected that highly conscientious individuals would craft their task boundaries more than their relational or cognitive boundaries, which, in turn, would affect their task performance or IRB. Research has indeed found conscientiousness to bear the strongest association with task performance (Barrick & Mount, 1991; Salgado, 1997). It is argued that individuals who score high on *Conscientiousness* are more likely to shape their task boundaries by finding the most efficient ways to carry out their work tasks to suit their own personal strengths and preferences. Accordingly, is the following is hypothesised:

Hypothesis 5 (a): There is a positive relationship between conscientiousness and task crafting; (b) Task crafting mediates the relationship between conscientiousness and IRB, or, stated otherwise, there is an indirect positive relationship between conscientiousness and IRB through task-crafting behaviour.

Because the concept of job crafting offers a somewhat new approach to job redesign that requires employees to take their own initiative in shaping their job characteristics, I believed that an individual would need to possess some degree of openness to experiences to engage in this novel behaviour. Individuals who score low on *Openness to experiences* are probably less likely to try new things such as job crafting, while those who are curious, imaginative, and willing to try new things (i.e. high on *Openness to experiences*) are probably more likely to step out of their comfort zone and engage in job-crafting behaviour. Furthermore, individuals with a high level of openness to experiences may use their imagination to find new and creative ways of improving the design of their jobs and their subsequent IRB. I therefore hypothesise the following:

Hypothesis 6 (a): There is a positive relationship between openness to experiences and task crafting; (b) Task crafting mediates the relationship between openness to experiences and IRB, or, stated otherwise, there is an indirect positive relationship between openness to experiences and IRB through task-crafting behaviour.

Finally, it was expected that individuals who scored high on *Neuroticism* would be less likely to engage in relational crafting behaviour. Neurotic individuals have the tendency to display fluctuating moods, to be emotionally unstable, and to be quite tense and touchy (John & Srivastava, 1999), all of which I believe may affect the ability of these individuals to establish and maintain healthy relationships at work, which, in turn, may affect their performance and, in particular, their OCB-I. The following is therefore hypothesised:

Hypothesis 7 (a): There is a negative relationship between neuroticism and relational crafting; (b) Relational crafting mediates the relationship between neuroticism and OCB-I, or, stated otherwise, there is an indirect negative relationship between neuroticism and OCB-I through relational crafting behaviour.

3.2.7 Dark Triad → Self-undermining → CWB

Since the concept of self-undermining was introduced a mere four years ago in the literature (see Bakker & Costa, 2014), the relationship between self-undermining behaviour and job performance remains somewhat of a mystery, with extant research being chiefly theoretical in nature (see Bakker & Costa, 2014; Bakker, 2015). However, given that self-undermining and self-handicapping share some conceptual resemblance, with one construct applying more to the actual workplace than the other (i.e. *self-undermining*), inferences can be drawn from previous research that addressed the self-handicapping–performance relationship. A meta-analysis conducted by Schwinger, Wirthwein, Lemmer, and Steinmayr (2014) found that self-handicapping reduced academic performance. Elliot, Cury, Fryer, and Huguet (2006), in their study, found that self-handicapping reduced performance in a sports-based activity. Taking these findings into account, it can be assumed that the same should apply for self-undermining behaviour and performance at work. In their theoretical analyses, Bakker and Costa (2014) and Bakker (2015) explained self-undermining from a JD-R perspective, and proposed that individuals who experience high levels of burnout (i.e. exhaustion) at work may engage in self-undermining behaviour, which may consequently result in higher job demands and, hence, decreased job performance — which the authors refer to as 'the loss cycle.' From a more empirical and convincing standpoint, Bakker and Wang (in press) indeed found that self-undermining was negatively related to supervisor ratings of job performance, suggesting that self-underminers are less likely to perform well and accomplish work tasks.

It has not been made clear in the literature which dimension of job performance would be most affected by self-undermining. In their development study of the Self-Undermining Scale, Bakker and Wang (in press) tested the predictive validity of *Self-undermining* on *Job performance*, where an example item for job performance read: "I am a highly productive employee." The *Job performance* dimension being tested seems somewhat unclear, but I am under the impression that it denotes *Task performance*. While the study concurs with the notion that self-undermining can negatively affect the manner in which employees carry out their prescribed role requirements (i.e. IRB), it contends that the job performance criterion most relevant to self-undermining behaviour is CWB, specifically toward other individuals (CWB-I). That is, when individuals engage in self-undermining acts, such as creating stress or conflict with co-workers, the chances are that they not only undermine their own functioning or performance, but their selfish acts also undermine those around them. This is best explained

by social contagion theory (Le Bon, 1895), which postulates that the thoughts, behaviours, and attitudes of one individual can easily be transmitted to another person or group of people. Given that the organisation is a collective or social unit, consisting of a number of individuals and groups (Etzioni, 1964), and the fact that teams are being extensively used within organisations (Devine, Clayton, Philips, Dunford, & Melner, 1999), this theoretical proposition is highly probable.

Berry, Carpenter, and Barratt (2012) conducted a meta-analysis that found a positive relationship between interpersonal conflict (a form of self-undermining) and CWB. That is, the more conflict individuals created with others, the more likely they were to engage in CWB. Spector and Fox (2005) proposed the Stressor–Emotion Model, which is based on the premise that CWB is a reaction to highly stressful conditions. These stressful conditions, in turn, lead to negative emotions (e.g., anger and frustration), which prompt individuals to engage in CWBs. With specific reference to self-undermining, Bakker and Costa (2014) posit that self-undermining leads to an increase in the level of job demands (e.g., workload, pressure, emotional demands). When employees experience excessive job demands, they are more likely to experience accompanying stress, which could fuel negative workplace behaviours such as CWB. With regard to the above, the following hypothesis was formulated:

Hypothesis 8: There is a positive relationship between self-undermining and CWB-I.

The infancy of self-undermining research has left many areas unexplored, one of them being the individual antecedents or drivers of this dysfunctional employee behaviour. Understanding the individual roots of self-undermining, we believe, may equip organisations with the knowledge to ameliorate its potential negative consequences. That is, if organisations can understand what leads or causes individuals to engage in behavioural self-undermining, they can take relevant actions, such as refining their recruitment and selection practices, to prevent such behaviour.

It is proposed that personality, as measured by the Dark Triad, influences the degree to which individuals engage in self-undermining acts. It has been proposed that personality affects the work behaviours of individuals (Barrick & Mount, 1991; Campbell, 1990; Salgado, 1997), which means that personality may affect the degree to which individuals self-undermine, since self-undermining is a form of workplace behaviour (Bakker & Costa, 2014). The relationship between the Dark Triad and self-undermining suffers from a lack of empirical backing, yet,

there have been studies that have used alternative taxonomies of personality as predictors of closely related concepts, such as self-handicapping. For example, previous research has used the FFM in explaining the relationship between personality and self-handicapping, where it was found that *Neuroticism* (+) and *Conscientiousness* (-) were significant predictors of self-handicapping behaviour (Ross, Canada, & Rausch, 2002), with the two traits explaining up to 25% of the variance in *Self-handicapping behaviour* (Bobo, Whitaker, & Strunk, 2013).

Machiavellianism, psychopathy, and narcissism all share a common dark core feature of callous manipulation (Furnham, Richards, & Paulhus, 2013; Jones & Paulhus, 2014). Research has shown that Machiavellians have the tendency to lie and exploit others (Moore, Detert, Klebe Trevino, Baker, & Mayer, 2012), psychopaths are key contributors to conflict and bullying behaviour (Baughman, Dearing, Giammarco, & Vernon, 2012), and narcissists view themselves as superior and are more domineering (Paulhus & Williams, 2002). In the present study, it was expected that these grandiose, manipulative, and socially malevolent features associated with the Dark Triad would all relate positively to self-undermining behaviour. That is, individuals with high scores on the Dark Triad would be more likely to engage in self-undermining acts, which include making mistakes, creating stress and conflict with co-workers, and creating a backlog in their tasks (Bakker & Wang, in press). The following is thus hypothesised:

Hypothesis 9: There is a positive relationship between (a) Machiavellianism, (b) psychopathy (c) narcissism respectively with self-undermining behaviour.

Hypothesis 10: There is a positive relationship between the Dark Triad (as a composite score) and self-undermining behaviour.

While it is well known that the Dark Triad is positively related to CWB (for a meta-analysis, see O'Boyle et al., 2012), minimal empirical evidence exists that specifies the processes through which this relationship unfolds. Accordingly, Baloch, Meng, Xu, Cepeda-Carrion, and Bari (2017) state that "the question remains unsolved whether the effect of the DT on CWB is more a direct effect or an indirect effect brought about through other organizational factors" (p. 8). Previous research has made attempts at answering this question. For example, Penny and Spector (2002) found that anger (an emotion) mediated the relationship between narcissism and CWB, suggesting that the higher individuals scored on *Narcissism*, the angrier they were, which, in turn, lead to higher reports of CWB. More recently, Baloch et al. (2017) found that

perceptions of organisational politics (POPS) partially mediated the relationship between the Dark Triad and CWB. In line with Bakker and Costa (2015), who conceptualise self-undermining as a behavioural process resulting from excessive burnout and leading to excessive job demands, I propose that self-undermining is a mediator of the relationship between the Dark Triad and CWB-I. That is, individuals who score high on the Dark Triad will likely create obstacles for themselves by engaging in self-undermining acts such as creating stress and conflict, which, in turn, will result in increased CWBs toward other individuals. The following is hypothesised:

Hypothesis 11 (a): Self-undermining mediates the relationship between Machiavellianism and CWB-I, or, stated otherwise, there is an indirect positive relationship between Machiavellianism and CWB-I through self-undermining behaviour; (b) Self-undermining mediates the relationship between psychopathy and CWB-I, or, stated otherwise, there is an indirect positive relationship between psychopathy and CWB-I through self-undermining behaviour; (c) Self-undermining mediates the relationship between narcissism and CWB-I, or, stated otherwise, there is an indirect positive relationship between narcissism and CWB-I through self-undermining behaviour; (d): Self-undermining mediates the relationship between the Dark Triad (as a total score) and CWB-I, or, stated otherwise, there is an indirect positive relationship between the Dark Triad and CWB-I through self-undermining behaviour.

3.3 METHODOLOGY

3.3.1 Respondents

In order to participate in the research, individuals were required to be working South Africans, have a minimum Grade 10 education level (for the purpose of filling out the personality questionnaires), to be proficient in English, language and be willing to participate. The total sample consisted of n = 580 individuals, of which 263 (46%) were men and 315 (54%) were women. The average age and organisational tenure was 35 years (SD = 11.24) and seven years (SD = 8.05) respectively. With regard to marital status, majority of the sample identified themselves as single (45%) or engaged/in a relationship (36%). In terms of ethnicity, 72% identified themselves as black African, 8% as Coloured/mixed race, 10% as white, and 8% as Indian. Majority of the sample were full-time (87%) working individuals, while the remaining were part-time (6%) or self-employed (4%). The sample represented various industries, including law, banking, insurance, education, healthcare, retail, and information technology.

3.3.2 Measures

3.3.2.1 The Basic Traits Inventory — short form

The Basic Traits Inventory — short form (BTI) (Taylor & De Bruin, 2005) was used to measure the Big Five personality traits of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experiences. Each trait measure comprises 12 items that are rated on a five-point Likert scale, with possible responses ranging from *1* (*Strongly disagree*) to *5* (*Strongly agree*). The BTI, developed specifically for the South African context, has shown to be cross-culturally valid and display good psychometric properties. In their validation study, Metzer, De Bruin, and Adams (2014) reported the reliability coefficients for *Extraversion* (α = .87), *Agreeableness* (α = .89), *Conscientiousness* (α = .93), *Neuroticism* (α = .92) and *Openness to experiences* (α = .87).

3.3.2.2 The Short Dark Triad

The Short Dark Triad (SD3) (Jones & Paulhus, 2014) was used to measure the Dark Triad of personality. The 27-item instrument measures three dark dimensions or traits, namely *Machiavellianism*, *Narcissism*, and *Psychopathy*, with each dimension consisting of nine items respectively. Responses are rated on a five-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). There have been mixed reviews concerning the measurement of the Dark Triad. Some researchers have measured the Dark Triad as three distinct dimensions (e.g., Papageorgiou, Wong, & Clough, 2017), while others have used a single Dark Core to conceptualise the dark side of personality (e.g., Bertl et al., 2017; Jonason et al., 2010). Despite issues surrounding its measurement, the SD3 has shown to be a reliable measure of the dark side of personality, with the following Cronbach alphas being reported: *Machiavellianism* α = .71, *Narcissism* α = .74, and *Psychopathy* α = .77) (Jones & Paulhus, 2014).

3.3.2.3 The Job Crafting Questionnaire

The Job Crafting Questionnaire (JCQ) (Slemp & Vella-Brodrick, 2013) was used to measure the three forms of job crafting, namely task, relational and cognitive crafting behaviour. The JCQ contains 15 items, with each dimension captured by five items respectively. Respondents are asked to rate the extent to which they engage in the various forms of job crafting on a frequency scale ranging from *1* (*Hardly ever*) to *6* (*Very often*). Reliability analyses have shown the JCQ to be a reliable measure of job-crafting behaviour. For example, Slemp and

Vella-Brodrick (2013), in their validation study, reported reliability scores of .87, .89, and .83 for *Task-*, *Cognitive,* and *Relational crafting* behaviour respectively.

3.3.2.4 The Self-Undermining Scale

The Self-Undermining Scale (Bakker & Wang, in press) was used to measure behavioural self-undermining. The instrument consists of six items that compositely measure the degree to which individuals self-undermine. The six items are rated on a five-point frequency scale where *1 = Never, 2 = Sometimes, 3 = Regularly, 4 = Often, 5 = Very often*. Bakker and Wang (in press) have found the instrument to be a reliable measure of self-undermining, with a reported Cronbach alpha of $\alpha = .88$.

3.3.2.5 Job performance

3.3.2.5.1 IRB and OCB-I

IRB and OCB-I were each measured with the seven items developed by Williams and Anderson (1991). A five-point Likert scale was used to capture responses which ranged from *1* (*Strongly disagree*) to *5* (*Strongly agree*). Previous research has demonstrated good psychometric properties for the IRB and OCB-I scales. For example, Tims et al. (2014) investigated the longitudinal impact of actual job crafting (Time 2) on job performance (Time 3) and found reliability coefficients of .86 and .84 for *IRB* and *OCB-I* respectively.

3.3.2.5.2 Counterproductive work behaviour toward individuals

Counterproductive work behaviour toward individuals (CWB-I) was measured with five items from the ten-item version of the Counterproductive Work Behaviour Checklist (CWB-C) **(**Spector, Bauer, & Fox, 2010). Responses were scored on a five-point frequency response format where *1 = Never, 2 = Once or twice, 3 = Once or twice/month, 4 = Once or twice/week, and 5 = Every day*. A recent study by Spector et al. (2010) found the CWB-C to be a reliable and valid measure of CWB, with an average Cronbach alpha of .78.

3.3.3 Research Procedure

As part of their course work in a research methodology module, undergraduate students were requested to administer the questionnaires to South African working individuals. Students were instructed to find individuals who had been working for a minimum of one year, who were proficient in English, and who were willing to participate in the research. The sealed

envelopes contained a biographical questionnaire and the instruments used to capture the variables under study. In addition, a cover letter accompanied the questionnaires, explaining the purpose of the study. The respondents were informed of their confidentiality and anonymity, and participation in the research was voluntary. They were also provided with the contact details of the researcher, in case they had any queries. Once the respondents had completed the surveys, they were requested to place and seal them in the envelopes, which were subsequently stored in a secure location. The research was approved by the Ethics Committee of the University of Johannesburg.

3.3.4 Statistical Analyses

All analyses were carried out using the statistical program *R* (R Core Team, 2016), using the *psych* (Revelle, 2016), *lavaan* (Rosseel, 2012) and *sem* (Fox, Nie, Byrnes, 2012) packages. R enables researchers to employ various statistical techniques, such as factor analysis and structural equation modelling (Culpepper & Aguinis, 2011). To summarise the basic features of the data set, descriptive statistics were inspected, including the mean, standard deviation, measures of central tendency (i.e. skewness, kurtosis), and reliability (Cronbach's alpha) of the scales. In addition, Pearson's product-moment correlation was used to assess the strength of the linear relationships between the variables.

3.3.4.1 Exploratory factor analysis

The expanding nature of the Dark Triad literature has led to distinctions between the three dark traits becoming obscure (*cf.* Jones & Paulhus, 2014). Given the ongoing debate and speculation surrounding the construct validity and dimensionality of the SD3, it was deemed necessary to perform an exploratory factor analysis (EFA) on the instrument. EFA is a useful technique for gaining insight into the dimensionality of items and scales (Netemeyer, Bearden, & Sharma, 2003). The fact that researchers have conceptualised the Dark Triad as either a total 'dark core' (Bertl et al., 2017; Jonason et al., 2010) or three distinct traits (Furnham, Richards, & Paulhus, 2013; Jones & Paulhus, 2014; Paulhus & Williams, 2002) sparked my interest to compare a one-factor to a three-factor solution. A parallel analysis with scree plot was performed initially, to determine how many factors to extract. Upon conducting the EFA, factor loadings and items variances were inspected. Items that displayed factor loadings less than .3, cross-loaded, or did not load at all, were considered problematic and removed for further analyses. The chi-square (X^2), Tucker-Lewis Index (TLI) and Bayesian information criterion (BIC) were used to

compare the different models. The model with the lowest X^2 and BIC, and the highest TLI, respectively was indicative of the model with the best fit.

3.3.4.2 Structural equation modelling

Structural equation modelling (SEM) was employed to test the hypothesised process or mediation models, which, according to Johnson and Schneider (2013), help explain the relationship between an antecedent variable and an outcome variable. Over the past decade, mediation analysis has gained popularity amongst behavioural and social scientists, as it enables one to explain how, or by what means, effects unfold (Preacher & Kelly, 2011, p. 93). SEM, a combination of factor analysis and regression, has many advantages, one being that it allows researchers to test complex relationships between theoretically linked latent constructs, and the other being that it corrects for the attenuating effect of measurement error (Hox & Bechger, 1998; Preacher & Kelly, 2011; Schumacker & Lomax, 2010).

In line with current practice, two steps were generally followed when conducting the SEM analysis, with the first step being the measurement component (essentially confirmatory factor analysis (CFA)), and the second being the structural component (Schreiber, Stage, King, Nora, & Barlow, 2006). In the first step, the theoretically implied factor structure was specified, where all the observed variables were set to load onto their respective latent constructs. In addition to global model fit, the standardised factor loadings, standard errors, unique variances of each item (indicator), and the covariances/correlations among the latent constructs were examined. Standardised factor loadings less than 0.3 were considered potentially problematic (I also considered factor loadings relative to other items). The measurement model that yielded satisfactory fit was subjected to the structural part of the analysis, which involved specifying the interrelations or structural paths between the latent constructs and observed variables. An indirect relationship was present when the paths between the independent and dependent variable, through the mediating variable, were statistically significant ($p < .05$). Goodness-of-fit (GOF) statistics were inspected in evaluating model fit, which included the incremental fit indices (i.e. X^2, TLI, Confirmatory Fit Index (CFI)), the absolute fit indices (i.e. root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR)). The study used conventional cut-off values for assessing overall model fit (i.e. CFI and TLI $\leq .90$; RMSEA and SRMR $\leq .08$) (Brown & Cudeck, 1993; Marsh, Hau, & Wen, 2004). Weighted least squares mean-and-variance adjusted (WLSMV) was used as the estimation

method, which, according to Schumacker and Lomax (2010), does not depend on the normality assumption. Brown (2006) argues that WLSMV, as a robust estimator, does not assume normally distributed variables, and it provides the best option for modelling ordered data. Beauducel and Herzberg (2006) indeed showed that this estimator functions better than maximum likelihood (ML) when analysing ordered categorical data. To determine the reliability of the SEM models, McDonald's (1999) coefficient omega was used, in particular omega hierarchical (ω_h). Omega is a more sensible index of internal consistency that is less at risk of overestimating or underestimating reliability (*cf.* Dunn, Baguley, & Brunsen, 2013). Zinbarg, Revelle, Yovel, and Li (2005) found that McDonald's omega coefficient outperforms Cronbach's alpha.

3.4 RESULTS

3.4.1 Descriptive Statistics

The descriptive statistics and Pearson's product-moment correlations are reported in Table 19. Apart from *CWB-I* and *Self-undermining* scores, none of the scales demonstrated problematic skewness or kurtosis. Inspection of normality revealed that Self-undermining and *CWB-I* scores were positively skewed, indicating that the sample's responses to these items clustered around lower ends of the distribution, or stated otherwise, respondents endorsed the lowest response categories possible when reporting on these particular behaviours. This finding comes as no surprise; when individuals respond to measures that tap into negative workplace behaviours, they have the tendency to under-report their true scores, for fear of getting caught out or punished by significant others (*cf.* Heneman, Heneman, & Judge, 1997). As such, they strategically manage their impressions to preserve their identity and self-esteem (Tedeschi & Reiss, 1981). Alternatively, the respondents may simply have been good organisational citizens who did engage in deviant workplace acts.

3.4.1.1 Reliability of the scales

The reliability coefficients (i.e. Cronbach's alpha) of the scales are reported diagonally in the correlation matrix below (see Table 19). Except for the three Dark Triad dimensions, the scales showed good internal consistency. *Machiavellianism* (α = .67), *Psychopathy* (α = .69) and, especially, *Narcissism* (α = .53) showed marginally acceptable reliability. Some of the items belonging to *Narcissism* (iN2, iN6, iN8) and *Psychopathy* (iP2, iP7) required reverse scoring, which could provide some reason for their low reliability. According to Taylor (2004), one

should exercise caution in the use of negatively keyed items, as these may cause some conceptual confusion and, hence, decreased reliability. With particular reference to the *Narcissism* dimension, inspection of the item reliabilities (i.e. *raw.r*) showed that items iN6 and iN8 had low reliability, and their item-to-total correlations (i.e. *r.cor*) were substantially low (i.e. < .20), suggesting that these two items explain little of the variance in *Narcissism*. The same pattern was found for items iP2 and iP7 for the *Psychopathy* dimension. Specifically, the items showed low item reliability, and their item-to-total correlations were both less than .1. Inspection of the reliability-if-item-dropped further showed that the reliability of the *Psychopathy* dimension would increase if these two items were dropped. We also made use of the 'check.keys' function to see whether any of the items belonging to the three dark dimensions were negatively correlated with their total score, and found that one item (iP2 — *Psychopathy*) was, even after being reverse scored, which may also explain its low reliability. According to Revelle (2014), low reliability for measures can attenuate the observed correlations between variables, and we thus considered it important to highlight any potentially problematic items, in terms of reliability, prior to further statistical analyses.

3.4.1.2 Correlational analysis

Table 18 provides the correlations between the study variables. With regard to the hypothesised relationships between the Big Five and job performance, results showed that there were significant positive relationships between *Conscientiousness* and *IRB* (r = .16; $p < .001$), *Extraversion* and *OCB-I* (r = .21; $p < .001$), *Agreeableness* and *OCB-I* (r = .23; $p < .001$), *Openness to experiences* and *IRB* (r = .09; $p < .05$), *Openness to experiences* and *OCB-I* (r = .16; $p < .001$), and between *Neuroticism* and *CWB-I* (r = .15; $p < .001$). Furthermore, significant negative relationships were found between *Neuroticism* and *IRB* (r = -.13; $p < .001$) and between *Neuroticism* and *OCB-I* (r = -.12; $p < .001$). All these findings provide support for Hypotheses 1(a) to 1(h). Looking at the relationships between the Dark Triad and job performance, Table 18 shows that there was a significant positive relationship between *Psychopathy* and *CWB-I* (r = .37; $p < .001$) and between the Dark Triad (total) and *CWB-I* (r = .21; $p < .001$), providing support for Hypotheses 2b and 2d. Contrary to our expectations, no relationship was found between *Machiavellianism* and *CWB-I* (r = .03; $p = ns$) or between *Narcissism* and *CWB-I* (r = .01; $p = ns$), thus leading to the rejection of Hypotheses 2a and 2c.

With respect to the job crafting–job performance relationship, significant positive relationships were found between *Task crafting* and *IRB* (r = .30; $p < .001$), *Relational crafting* and *OCB-I* (r = .33; $p < .001$), *Cognitive crafting* and *IRB* (r = .34; $p < .001$), and between *Cognitive crafting* and *OCB-I* (r = .22; $p < .001$), providing support for Hypotheses 3a to 3d. Looking at the relationships between the Big Five personality traits and job-crafting behaviour, significant positive relationships were found between *Extraversion* and *Relational crafting* (r =.25; $p < .001$), *Agreeableness* and *Relational crafting* (r = .18; $p < .001$), *Conscientiousness* and *Task crafting* (r = .12; $p < .001$), and between *Openness to experiences* and *Task crafting* (r = .14; $p < .001$), providing support for Hypotheses 4a, 5a, and 6a respectively. Hypothesis 7a, which stated that there would be a negative relationship between neuroticism and relational crafting, was also supported (r = -.18; $p < .001$).

Turning to the relationships between the dark measures, a significant positive relationship was found between *Self-undermining* and *CWB-I* (r = .45; $p < .001$), *Psychopathy* and *Self-undermining* (r = .27; $p < .001$), and between the Dark Triad (total) and *Self-undermining* (r = .16; $p < .001$), providing support for Hypotheses 8, 9b, and 10. Interestingly, no relationships found between *Machiavellianism* and *Self-undermining* (r = .02; $p = ns$) or between *Narcissism* and *Self-undermining* (r = -.02; $p = ns$), leading to the rejection of Hypotheses 9a and 9c.

Table 18

Descriptive statistics, reliabilities, means, standard deviations, and correlations ($N = 580$)

Measure	*M*	*SD*	Skew	Kurt	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. TC	4.05	1.05	-.39	-.07	(.74)															
2. RC	4.17	1.02	-.28	-.33	.43**	(.71)														
3. CC	4.64	1.05	-.77	.28	.43**	.37**	(.82)													
4. SU	1.74	.55	1.46	2.83	-.13**	-.08	-.12**	(.72)												
5. IRB	4.28	.55	-.79	.88	.30**	.23**	.34**	-.35**	(.78)											
6. OCB-I	3.64	.68	-.45	.46	.33**	.33**	.22**	-.08	.29**	(.77)										
7. CWB-I	1.56	.53	2.03	4.45	-.20**	-.13**	-.23**	.45**	-.37**	-.18**	(.78)									
8. Open	3.79	.58	-.33	.33	.14**	.12**	.09*	-.03	.09*	.16**	-.13**	(.82)								
9. Cons	3.98	.68	-0.71	0.66	.12**	.16**	.14**	-.08*	.16**	.22**	-.16**	.48**	(.90)							
10. Extra	3.63	.59	-.50	.11	.16**	.25**	.18**	-.01	.13**	.21**	-.07	.41**	.38**	(.79)						
11. Agree	3.95	.57	-0.63	1.04	.08	.18**	.12**	-.12**	.10*	.23**	-.21**	.54**	.58**	.33**	(.83)					
12. Neuro	2.39	.72	.31	-.36	-.10*	-.18**	-.06	.12**	-.13**	-.12**	.15**	-.29**	-.30**	-.21**	-.31**	(.85)				
13. Mach	3.32	.63	-.13	.12	-.05	-.01	.02	.02	.02	.02	.03	.09*	.00	.09*	.02	.00	(.67)			
14. Narc	3.13	.52	.15	.49	.19**	.23**	.18**	-.02	.10*	.07	.01	.11*	.00	.19**	-.01	-.08	.25**	(.53)		
15. Psych	2.22	.65	.31	-.31	-.07	-.09*	-.15**	.27**	-.28**	-.19**	.37**	.00	-.09*	.01	-.16**	.16**	.27**	.23**	(.69)	
16. DarkTri	77.98	11.56	.27	.11	.01	.04	.01	.16**	-.09*	-.09*	.21**	.10*	-.03	.13**	-.08	.05	.73**	.65**	.73**	(.74)

Note. * $p < 0.05$; ** $p < 0.01$. TC = Task Crafting; RC = Relationship Crafting; CC = Cognitive Crafting; SU = Self-undermining; IRB = In-role Behaviour; OCB-I = Organisational citizenship behaviour targeted toward individuals; CWB-I = Counterproductive work behaviour towards individuals; Open = Openness to Experience; Cons = Conscientiousness; Extra = Extraversion; Agree = Agreeableness; Neuro = Neuroticism; Mach = Machiavellianism; Narc = Narcissism; Psych = Psychopathy; DarkTri = Composite score of all the dark traits.

3.4.2 Structural Equation Modelling

3.4.2.1 The FFM→ Job crafting→ Job performance

Extraversion → Relational crafting → OCB-I

To investigate the indirect relationship between extraversion and OCB-I through relational crafting behaviour (*Hypothesis 4b*), the hypothesised measurement model (ModelEx1) was first specified. ModelEx1 consisted of three latent variables, namely *Extraversion* (12 items), *Relational crafting* (five items) and *OCB-I* (seven items). The measurement model ran and converged after 38 iterations, and the following fit was found: $X^2_{(249)}$ = 951.77; CFI = .88; TLI = .86; RMSEA = .08 [90% CI[8]: .07, .08]; SRMR = .07. The correlations between the latent variables were reported as follows: *Extraversion* ~~[9] *Relational crafting* (.33), *Extraversion* ~~ *OCB-I* (.27), and *Relational crafting* ~~ *OCB-I* (.46). All the items' standardised loadings ranged from .22 to.79. All the items had small standard errors and were statistically significant indicators of their respective latent construct. One item belonging to *Extraversion* (iE2: "I like to be the centre of attention"), however, showed an undesirably low factor loading of .22 (R^2 =.05). It was then decided to rerun the hypothesised measurement model (ModelEx1a) without *iE2* ($X^2_{(227)}$ = 826.67; CFI = .89; TLI = .88; RMSEA = .07 [90% CI: .07, .08]; SRMR = .07; WRMR = 1.58). Although the incremental fit indices (TLI and CFI) were lower than desired (≤ .90), the absolute fit indices (RMSEA and SRMR) suggested adequate fit for the proposed measurement model. To determine whether ModelEx1a was indeed the best-fitting measurement model, I compared it to an alternative model (ModelEx1b), where all items were made to load on a single latent variable. The fit of the alternative model was substantially worse ($X^2_{(252)}$ = 2734.81; CFI = .56; TLI = .52; RMSEA = .14 [90% CI: .135, .144]; SRMR = .13, WRMR = 2.96). ModelEx1a was indeed the best-fitting model, and was thus subjected to further analysis.

[8] CI= 90% confidence intervals for the RMSEA estimates

[9] ~~ = Correlation or covariance symbol

In the second step, the structural paths between the latent variables were modelled with both the direct and indirect relationships included (ModelEx2). *Extraversion* served as the independent or predictor variable, *OCB-I* as the dependent or outcome variable, and *Relational crafting* as the mediator variable. The sample covariance matrix produced the following model fit: $X^2_{(227)} = 826.66$; CFI = .89; TLI = .88; RMSEA = .07 [90% CI: .067, .077]; SRMR = .067; WRMR = 1.58). The implied theoretical model was not as strong as desired; therefore, an investigation of the modification indices was performed to detect potential specification errors, or what is commonly known as a *specification search* (Schumacker & Lomax, 2010). Inspection of the residual matrix showed that there was some evidence of large residuals between parameters of the observed covariance matrix and the model-implied covariance matrix.

The modification indices for each parameter were investigated to identify what was potentially causing the lower-than-desired model fit. In particular, the study looked at the change in chi-square if the parameter were to be freely estimated. Results showed that, if the residuals of items iE4 ("People see me as an energetic person") and iE6 ("I am usually active") were allowed to correlate, there would be an approximate 56.51 change (decrease) in the chi-square value. This change in chi-square value was substantially large, relative to the other parameters. Looking at the content of these two items, besides *Extraversion*, the items shared some common unexplained variance, possibly how "lively" the person is, hence explaining the residual correlations. It was also found that if the residuals of items iE11 ("I like to meet people") and iE12 ("I find it easy to talk to people I have just met") were allowed to correlate, there would be an approximate 125.69 change (decrease) in chi-square value.

Apart from *Extraversion*, these two items share some common unexplained variance, namely an individual's orientation towards other people, specifically those whom they have met or are about to meet, which is why their residuals may want to correlate. Lastly, if the residuals of items JC12 ("I organise or attend work-related social functions") and JC14 ("I choose to mentor new employees [officially or unofficially]") were allowed to cross-load onto *OCB-I*, there would be a decrease of 65.05 and 63.56 in the chi-square value respectively. To recall, *OCB-I* refers to voluntary and extra-role employee behaviours that are targeted towards other individuals. It is not surprising that the residuals of JC12 and JC14 wanted to load onto *OCB-I*, as these two items not only measure relational crafting behaviour, but also extra-

role/voluntary behaviours (i.e. attending social functions at work and mentoring) that are not part of the individual's formal job description (OCB-I). According to Schumacker and Lomax (2010) and Brown (2006), one should have substantive theoretical reasoning to use modification indices. Based on the above arguments and the similarities that were found in item content, there were strong theoretical grounds to apply the modifications to the hypothesised structural model.

The structural model (ModelEx2a) was then run with the modifications included. Results showed that ModelEx2a ($X^2_{(223)} = 602.34$; CFI = .93; TLI = .92; RMSEA = .06 [90% CI: .052, .063]; SRMR = .06; WRMR = 1.31) produced a better-fitting model, and was thus chosen for further interpretation. ModelEx2a revealed that there was an indirect positive relationship between *Extraversion* and *OCB-I* through *Relational crafting* (β = .14; p < .001). That is, relational crafting mediated the relationship between extraversion and OCB-I, providing support for Hypothesis 4b. Comparison of the modified structural model (ModelEx2a) to the originally implied structural model (ModelEx2) showed that there was no real substantive difference with respect to the indirect relationship, just that the modified model (ModelEx2a), as a whole, produced better overall fit. McDonald's (1999) coefficient omega for ModelEx2a was .87, indicative of good model reliability. Figure 21, below, depicts the final hypothesised structural model with the standardised path estimates.

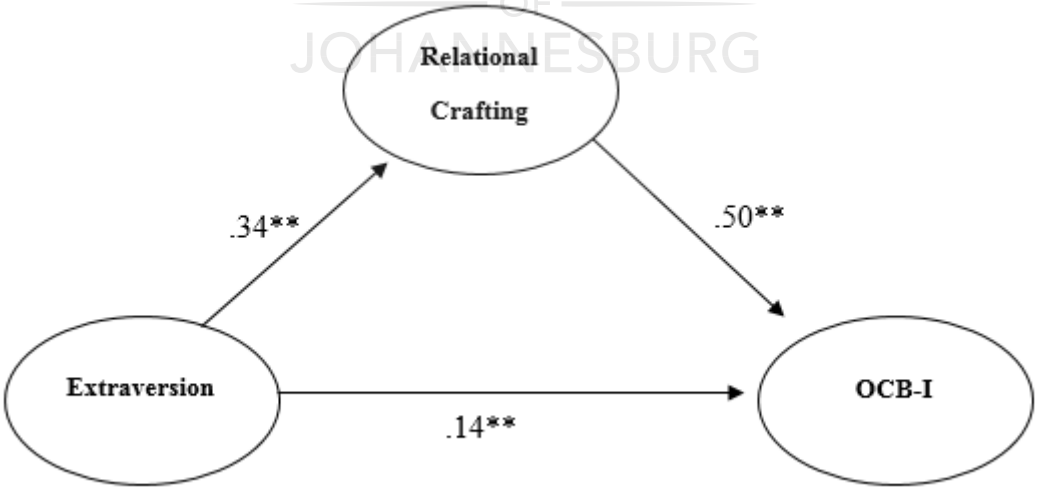

Figure 21. Path diagram between *Extraversion*, *Relational crafting*, and *OCB-I*

Agreeableness → Relational crafting → OCB-I

To investigate the indirect relationship between agreeableness and OCB-I through relational crafting behaviour (Hypothesis 4c), the same process was followed. The hypothesised measurement model (ModelA1) was run with three latent constructs, namely *Agreeableness* (12 items), *Relational crafting* (five items) and *OCB-I* (seven items). The measurement model converged after 45 iterations and produced the following fit: $X^2_{(249)} = 877.38$; CFI = .90; TLI = .89; RMSEA = .07 [90% CI: .065, .075]; SRMR = .07; WRMR = 1.57. The intercorrelations between the latent variables were as follows: *Agreeableness ~~ Relational crafting* (.23), *Agreeableness ~~ OCB-I* (.26), and *Relational crafting ~~ OCB-I* (.45).

All the items' standardised loadings ranged from .39 to .77 on their respective latent variables. None of the items displayed noticeably large standard errors, and all items were found to be significant indicators of their respective latent constructs. However, one item (iA1: "I admit when I have done something wrong") of *Agreeableness* had an undesirably low standardised factor loading (.39) relative to the other items. In an attempt to improve the fit of the model, a new measurement model (ModelA1a) was run without item iA1. The incremental fit of the new measurement model did not improve, and the absolute fit worsened, so it was decided to retain the original measurement model. To ensure that the originally hypothesised measurement model (ModelA1) was indeed the best-fitting model, from a measurement perspective, the study compared it to an alternative model (ModelA1c), where all items were set to load on a single latent construct. As anticipated, the alternative one-factor model showed worse fit: $X^2_{(252)} = 3156.78$; CFI = .53; TLI = .48; RMSEA = .15 [90% CI: .145, .152]; SRMR = .14; WRMR = 3.22, and so the original hypothesised measurement model was subjected to further analysis.

In the second step, the direct and indirect structural paths was specified between the independent variable (*Agreeableness*), the dependent variable (*OCB-I*) and the mediator (*Relational crafting*) variable. The hypothesised structural model (ModelA2) with three latent variables produced the following fit: $X^2_{(249)} = 877.38$; CFI = .90; TLI = .89; RMSEA = .07 [90% CI: .065, .075]; SRMR = .07; WRMR = 1.57. All the items produced statistically significant standardised loadings and small standard errors. I was not completely satisfied with the overall fit of the model, and thus considered the use of modification indices.

Previous model specification searches in earlier analyses highlighted that the residuals of two items (JC12 and JC14) of *Relational crafting* wanted to load onto the latent variable *OCB-I*. Since the same two variables (*Relational crafting* and *OCB-I*) were used in this analysis, it made theoretical and practical sense to modify these two model parameters accordingly. Inspection of the modification indices, in particular the change in chi-square, indeed corroborated the previous findings, showing that, if we allowed the residuals of JC12 and JC14 to cross-load onto *OCB-I*, there would be a 63.246 and 71.830 approximate change (decrease) in chi-square respectively. Additionally, it was found that, if I allowed the residuals of item A6 ("I give clothes or food to needy people") and A8 ("I like to donate things to a good cause") of *Agreeableness* factor to correlate, there would be an excessive 149.278 approximate change (decrease) in chi-square. Looking at the content of these two items, apart from measuring an individual's agreeableness, they both share some common unexplained variance, namely the extent to which an individual is benevolent, kind, and giving, which is why their residuals may want to correlate. Having substantive reasoning to do so, the suggested modifications were applied and the new structural covariance model was then run (ModelA2a). ModelA2a produced a better-fitting model: $X^2_{(246)} = 663.05$; CFI = .93; TLI = .92; RMSEA = .06 [90% CI: .052, .063]; SRMR = .06; WRMR = 1.33. Further investigation of the path estimates showed that there was a positive indirect relationship between *Agreeableness* and *OCB-I* through *Relational crafting* (β = .10; p < .001). That is, relational crafting mediated the relationship between agreeableness and OCB-I, providing support for Hypothesis 4c. The overall reliability of the hypothesised structural model was .88 (McDonald, 1999). Figure 22, below, provides the standardized estimates for the final structural model.

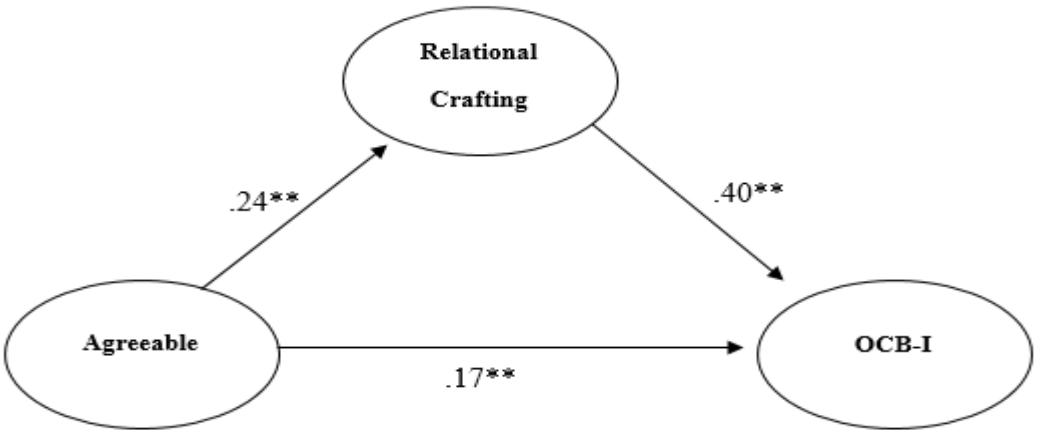

Figure 22. Path diagram between *Agreeableness*, *Relational crafting*, and *OCB-I*

Conscientiousness → Task crafting → IRB

To investigate the indirect relationship between conscientiousness and IRB through task crafting behaviour (Hypothesis 5b), the hypothesised measurement model (ModelC1) was first specified. ModelC1 consisted of three latent variables, namely *Conscientiousness* (12 items), *Task crafting* (five items) and *IRB* (seven items). Converging after 44 iterations, the hypothesised measurement model showed good fit to the data: $X^2_{(249)}$ = 757.48; CFI = .95; TLI = .95; RMSEA = .06 [90% CI: .058, .069]; SRMR = .06; WRMR = 1.44. The intercorrelations between the latent variables were as follows: *Conscientiousness ~~ Task crafting* (.15), *Conscientiousness ~~ IRB* (.18), and *Task crafting ~~ IRB* (.38). All the items had high standardised loadings ranging from .44 to .91 across the three latent variables. The standard errors across the items were small, and each item proved to be a statistically significant predictor of its respective latent construct. In order to ensure that ModelC1 was indeed the best-fitting measurement model, it was compared to an alternative one-factor model (ModelC1a). As expected, ModelC1a ($X^2_{(252)}$ = 4290.34; CFI = .61; TLI = .58; RMSEA = .18 [90% CI: .173, .182]; SRMR = .19; WRMR = 4.10) showed poor fit, and, thus, it was decided to retain the original hypothesised measurement model for further analysis.

In the second step of the SEM, the hypothesised direct and indirect structural paths between the latent variables were specified. The structural model (ModelC2) consisted of three latent variables, namely *Agreeableness* (independent variable), *Task crafting* (mediator), and *IRB* (dependent variable). ModelC2 yielded good fit: $X^2_{(249)}$ = 757.48; CFI = .95; TLI = .95; RMSEA = .06 [90% CI: .058, .069]; SRMR = .06; WRMR = 1.44. The path estimates showed that there was an indirect relationship between *Conscientiousness* and *IRB* through *Task crafting* (β = .06; p < .01), or, stated otherwise, task crafting mediated the relationship between conscientiousness and IRB, providing support for Hypothesis 5b. McDonald's (1999) omega showed good reliability for the hypothesised structural model (.92). The standardized path estimates of the direct and indirect relationships are shown in Figure 23, below.

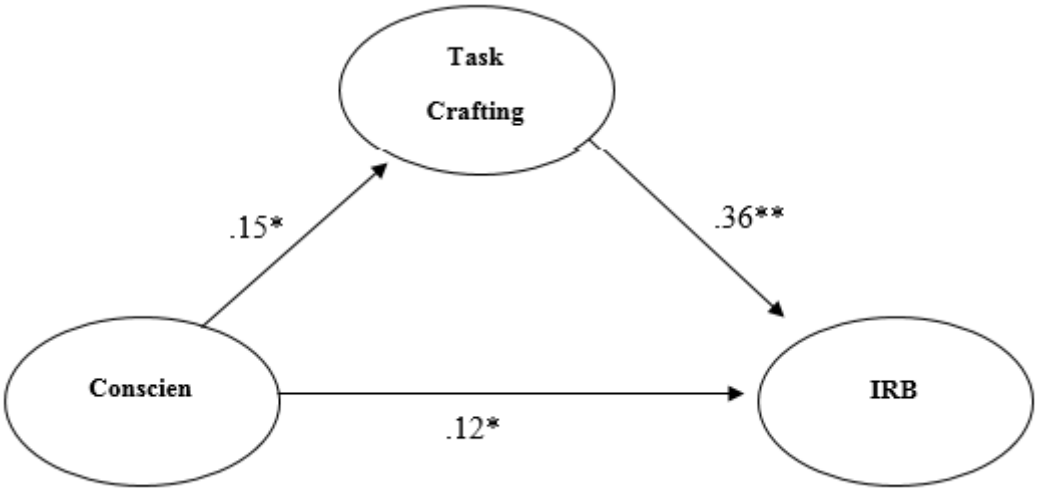

Figure 23. Path diagram between *Conscientiousness*, *Task crafting*, and *IRB*

Openness to experience → Task crafting → IRB

To investigate the indirect relationship between openness to experience and IRB through task crafting (Hypothesis 6b), the hypothesised measurement model (ModelO1) was specified, which consisted of three latent variables, namely *Openness to experience* (12 items), *Task crafting* (five items), and *IRB* (seven items). The measurement model converged after 38 iterations and showed good fit: $X^2_{(249)}$ = .642.54; CFI = .95; TLI = .94; RMSEA = .06 [90% CI: .051, .062]; SRMR = .06; WRMR = 1.33. The intercorrelations between the factors were: .19 (*Openness to experience ~~ Task crafting*), .11 (*Openness to experience ~~ IRB*) and .40 (*Task crafting ~~ IRB*). All the items proved to be statistically significant, with small standard errors observed. The standardised factor loadings ranged from .45 (iO7) to .93 (iIRB3) across all the items. Two items of *Openness to experience* (iO7 and iO8) and one item of *IRB* (iIRB5) showed relatively small standardised factor loadings (<.49) and R^2 values relative to their other items. It was decided to remove these items for model comparison purposes, but it was found that the altered measurement model (ModelO1a) did not yield better fit. An alternative model (ModelO1b) was specified, where all the items were set to load onto a single latent variable, and it was found that the alternative model showed worse fit: $X^2_{(189)}$ = .3033.60; CFI = .61; TLI =.56; RMSEA = .17 [90% CI: .168, .179]; SRMR = .19; WRMR = 3.82. The original hypothesised measurement model (ModelO1) was retained and subjected to further analysis.

In the second part of the SEM, the hypothesised structural model (ModelO2) was constructed with both the direct and indirect paths specified between the three latent variables: *Openness*

to experience (independent variable), *Task crafting* (mediator), and *IRB* (dependent variable). ModelO2 produced good fit: $X^2_{(249)}$ = 642.54; CFI = .95; TLI = .94; RMSEA = .06 [90% CI: .051, .062]; SRMR = .06; WRMR = 1.33. Upon further inspection of the relationships between the latent constructs, *Task crafting* was found to mediate the relationship between *Openness to experience* and *IRB* (β = .07; p < .001). This finding provided support for Hypothesis 6b, which states that there would be an indirect relationship between openness to experience and IRB through task-crafting behaviour. McDonald's coefficient omega for the overall model was .88, suggestive of good model reliability. Figure 24, below, depicts the standardised path estimates for ModelO2. The direct relationship between *Openness to experience* and *IRB* was not statistically significant (p = .478); hence, there is a dashed path between the constructs.

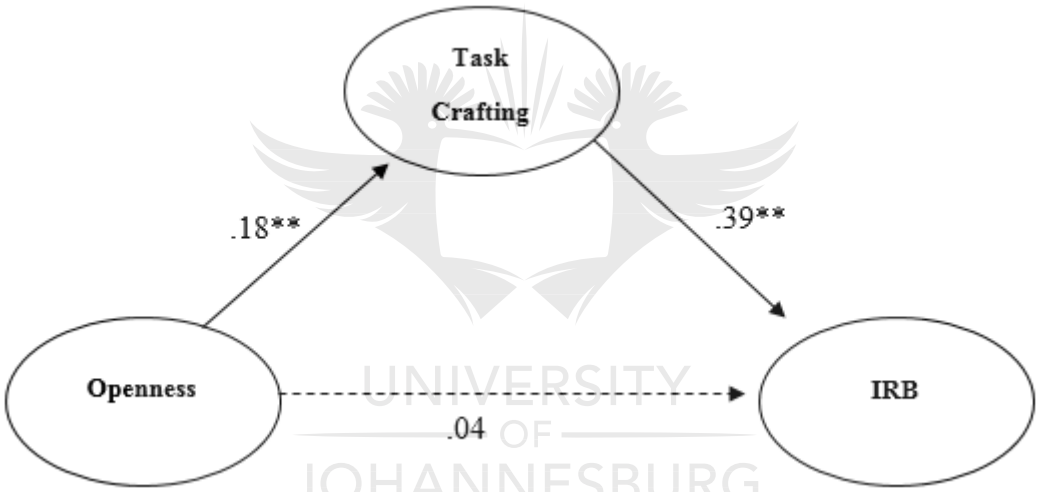

Figure 24. Path diagram between openness, task crafting and IRB.

Neuroticism → Relational crafting → OCB-I

To investigate the indirect relationship between neuroticism and OCB-I through relational crafting (Hypothesis 7b), the hypothesised measurement model (ModelN1) was first specified. Consisting of three latent variables, namely *Neuroticism* (12 items), *Relational crafting* (five items), and *OCB-I* (seven items), the measurement model converged after 48 iterations and produced the following fit: $X^2_{(249)}$ = .892.74; CFI = .91; TLI = .90; RMSEA = .07 [90% CI: .066, .076]; SRMR = .07; WRMR = 1.62. The original measurement model was compared to a new model (ModelN1a) that consisted of modifications to the two latent factors *Relational*

crafting and *OCB-I* that were suggested by previous modification indices in earlier analyses. In particular, I allowed items JC12 and JC14 to cross-load onto the latent factor *OCB-I,* as these two items previously showed to have some conceptual overlap with *OCB-I.* I also removed one item (iN1) from *Neuroticism,* as it produced a low standardised factor loading of .36 (R^2 = .13) in comparison to the other items. The new measurement model (ModelN1a) yielded improved fit: $X^2_{(247)}$ = .817.39; CFI = .93; TLI = .92; RMSEA = .06 [90% CI: .058, .069]; SRMR = .06; WRMR = 1.45. The correlations between the factors were: -.21 (Neuroticism ~~ *Relational crafting*), -.14 (*Neuroticism ~~ OCBI*), and .44 (*Relational crafting ~~ OCBI*). The standardised factor loadings ranged from .47 (iNeur2) to .83 (*iJC128*), and all the items proved to be statistically significant predictors of their latent constructs. ModelN1a was then subjected to the structural component part of the analysis.

The hypothesised structural model (ModelN2) was constructed with both the indirect and direct relationships included between the three latent variables. *Neuroticism* served as the independent variable, *Relational crafting* as the mediator, and *OCB-I* as the dependent variable. The fit of the structural model was as follows: $X^2_{(247)}$ = .817.39; CFI = .93; TLI = .92; RMSEA = .06 [90% CI: .058, .069]; SRMR = .06; WRMR = 1.45. Model2 further showed that there was an indirect negative relationship between *Neuroticism* and *OCB-I* through *Relational crafting* (β = -.09; $p < .001$), or that *Relational crafting* mediated the relationship between *Neuroticism* and *OCB-I,* providing support for Hypothesis 7b. McDonald's coefficient omega for the overall model was .84, suggestive of good model reliability. Figure 25, below, depicts the standardized path estimates for the structural model. The direct relationship between *Neuroticism* and *OCB-I* was not statistically significant (p = .25); hence, there is a dashed path between the constructs.

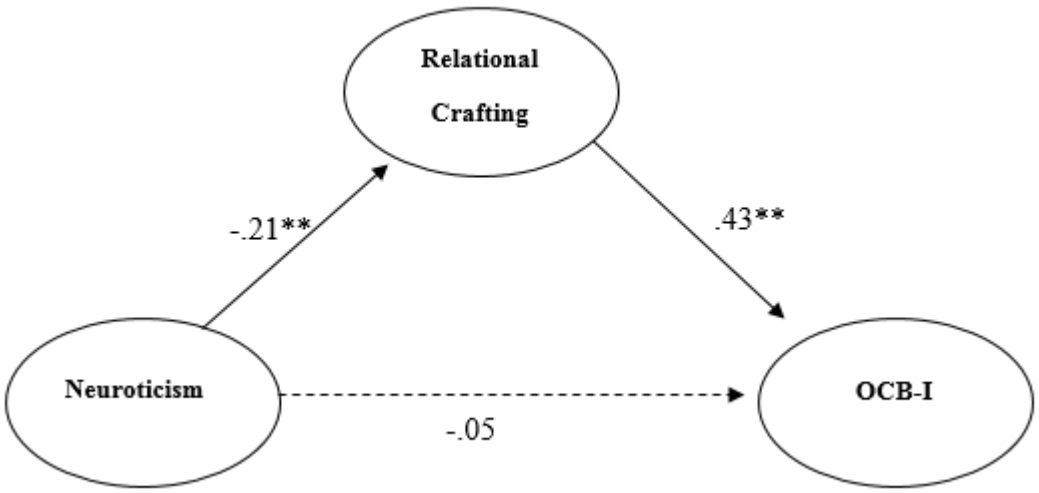

Figure 25. Path diagram between *Neuroticism*, *Relational crafting*, and *OCB-I*

3.4.2.2 The Dark Triad → Self-undermining → Job performance

Exploratory Factor Analysis (EFA) of the SD3

A parallel analysis and scree plot was performed on the SD3. The parallel analysis with scree plot suggested that the number of factors to extract was four. It was then decided to run an EFA where a one-factor, three-factor, and four-factor solution were compared. Table 19 shows that the three-factor and four-factor solution outperformed the one-factor solution. Although the four-factor solution showed better incremental fit (TLI) than the three-factor solution, there was no real substantive difference in terms of absolute fit. The main purpose of the EFA was to determine whether the SD3 adhered better to a one-factor or three-factor structure. In this light, results showed that the SD3 should be measured as a three-factor structure, rather than a one-factor solution. For the three-factor model, the proportion of the variance explained by each of the factors were: .48 (*Psychopathy*), .30 (*Machiavellianism*) and .22 (*Narcissism*).

Table 19

Exploratory Factor Analysis of the SD3

	X^2	*df*	BIC	TLI	RMSEA	RMSR
One-factor	1364	324	-697.72	.55	.006 (.006, .078)	.08
Three-factor	657.02	273	-1080.09	.802	.002 (.002, .054)	.04
Four-factor	506.01	249	-1078.38	.855	.002 (.002, .047)	.04

Further inspection of the 27 items with a three-factor model imposed on the SD3 data showed that there were some problematic items. A cut-off of .30 was used to determine whether an item loaded sufficiently onto its respective construct. For the *Machiavellian* dimension, three items (iD5, iD6, and iD8) cross-loaded onto the *Psychopathy* dimension. For *Narcissism*, four items (iD11, iD15, iD17, and iD18) did not load onto the construct, and one item (iD14) cross-loaded onto *Machiavellianism*. With respect to *Psychopathy*, two items (iD20 and iD25) did not load onto the construct. After the removal of the problematic items, a 17-item measure was left to measure *Machiavellianism* (six items), *Narcissism* (four items), and *Psychopathy* (seven items). The 17-item measure was retained and subjected to further SEM analyses, the results of which are reported below.

Machiavellianism → Self-undermining → CWB-I

To investigate the indirect relationship between Machiavellianism and CWB-I through self-undermining (Hypothesis 11a), the hypothesised measurement model (i.e. CFA) was first specified. ModelM1 consisted of *Machiavellianism* (six items), *Self-undermining* (six items), and *CWB-I* (five items), and produced the following fit: $X^2_{(116)} = 307.61$; CFI = .93; TLI = .92; RMSEA = .06 [90% CI: .047, .062]; SRMR =.07; WRMR = 1.18. One item from *Machiavellianism* (iD9) produced a low standardised factor loading of .29 (R =.09). For model comparison purposes, the original model (ModelM1) was compared to a new model (ModelM1a) that excluded the problematic item. ModelM1a was found to produce a better-fitting model: $X^2_{(101)} = 245.50$; CFI = .95; TLI = .94; RMSEA = .05 [90% CI: .043, .059]; SRMR = .06; WRMR = 1.08. The correlations between *Machiavellianism* and *Self-*

undermining (r = -.12; p = .06) and between *Machiavellianism* and *CWB-I* (r = -.01; p = .90) were non-significant. *Self-undermining* and *CWB-I*, on the other hand, had a high intercorrelation of .61 (p < .001). Although the correlation between *Self-undermining* and *CWB-I* was relatively high, it was well below the recommended .90 cut-off, suggesting that these two constructs measure separate variables and do not present a case of multicollinearity (Pallant, 2011). The standardised factor loadings ranged from .35 (iSU1) to .89 (iCWB7), and the standard errors were noticeably small across all the items.

I proceeded to specify the structural paths between the three latent constructs, referred to as ModelM2. ModelM2 consisted of the direct and indirect relationships between *Machiavellianism* (independent variable), *Self-undermining* (mediator), and *CWB-I* (dependent variable). The results from the structural model showed that there was no indirect relationship between *Machiavellianism* and *CWB-I* through *Self-undermining* (β = -.07; p = .07), leading to the rejection of Hypothesis 11a. McDonald's coefficient omega (ω_h) for ModelM2 was .78.

Psychopathy → Self-undermining → CWB-I

To investigate the indirect relationship between psychopathy and CWB-I through self-undermining (Hypothesis 11b), the hypothesised measurement model (ModelP1) was initially specified. ModelP1 consisted of *Psychopathy* (seven items), *Self-undermining* (six items), and *CWB-I* (five items), and, after 38 iterations, produced the following model fit: $X^2_{(132)}$ = 319.72; CFI = .96; TLI = .92; RMSEA = .05 [90% CI: .043, .058]; SRMR = .06; WRMR = 1.07. The reported statistically significant correlations between the latent constructs were as follows: .37 (*Psychopathy ~~ Self-undermining*), .28 (*Psychopathy ~~ CWB-I*) and .51 (*Self-undermining ~~ CWB-I*). The standardised factor loadings ranged from .35 (iSU1) to .87 (iCWB7), and the standard errors were noticeably small across all the items.

In the second step, the hypothesised structural model (ModelP2) was specified with both the direct and indirect paths included between the latent constructs. *Psychopathy* was specified as the predictor variable, *Self-undermining* as the mediator, and *CWB-I* as the outcome variable. The hypothesised structural model revealed that there was indeed an indirect relationship between *Psychopathy* and *CWB-I* through *Self-undermining* (β = .19; p <.001). That is, self-undermining mediated the relationship between psychopathy and CWB-I, providing support

for Hypothesis 11b. The reliability (ωh) of ModelP2 was .88 (McDonald, 1999). Figure 26, below, presents the standardized path estimates between the latent factors for ModelP2.

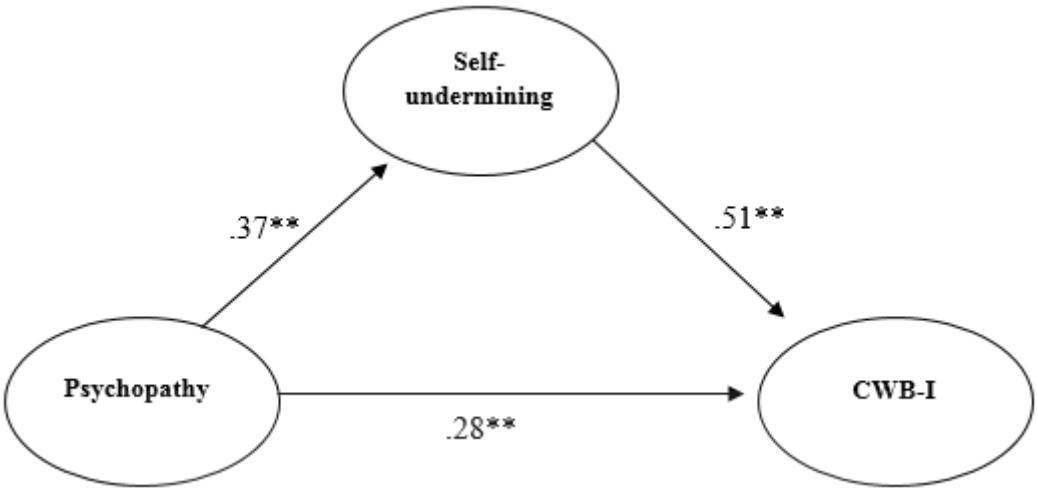

Figure 26. Path diagram between *Psychopathy*, *Self-undermining*, and *CWB-I*

Narcissism → Self-undermining → CWB-I

To investigate the indirect relationship between narcissism and CWB-I through self-undermining (Hypothesis 11c), the hypothesised measurement model (ModelN1) was specified, which consisted of three latent variables, namely *Narcissism* (four items), *Self-undermining* (six items), and *CWB-I* (five items). The measurement model converged after 41 iterations and produced the following model fit: $X^2_{(87)}$ = 224.30; CFI = .95; TLI = .95; RMSEA = .05 [90% CI: .044, .062]; SRMR = .06; WRMR = 1.08. The correlations between *Narcissism* and *Self-undermining* (r = -.00; p = .95) and between *Narcissism* and *CWB-I* (r = .07; p = .18) were not statistically significant. However, *Self-undermining* and *CWB-I* again showed a strong correlation of .62 (p < .001). The standardised factor loadings across all the items ranged from .32 (iD10) to .88 (iCWB7). None of the items displayed large standard errors.

I proceeded to construct the hypothesised structural model (ModelN2) with the direct and indirect paths included between the latent variables. *Narcissism* and *CWB-I* were the independent and dependent variables respectively, and *Self-undermining* was the mediator variable. Although the structural model produced good reliability (ωh = .82), it showed that the indirect relationship between *Narcissism* and *CWB-I* through *Self-undermining* was not

statistically significant (p = .95), leading to the rejection of Hypothesis 11c. That is, self-undermining did not mediate the relationship between narcissism and CWB-I.

Dark Triad → Self-undermining → CWB-I

The Dark Triad has been referred to as a set of second- or higher-order constructs that share a common core feature of callousness and malevolence (Jakobitz & Egan, 2006; Pailing et al., 2014; Wai & Tilipoulos, 2012). Accordingly, I was curious to investigate whether the Dark Triad performed well as a higher-order construct in predicting *CWB-I* through *Self-undermining*. To investigate the indirect relationship between the Dark Triad (total) and CWB-I through self-undermining behaviour (Hypothesis 11d), I first ran a measurement model (ModelDT) with all the latent variables included. In ModelDT, the Dark Triad was specified as a higher-order factor consisting of three second-order factors, namely *Machiavellianism* (six items), *Narcissism* (four items), and *Psychopathy* (seven items). For the three dark traits, only those items that previously showed to be good estimates of their respective latent constructs were used. ModelDT comprised two additional latent constructs, namely *Self-undermining* (six items) and *CWB-I* (five items). The measurement model converged after 91 iterations and produced the following fit: $X^2_{(344)}$ = 891.24; CFI = .90; TLI = .89; RMSEA = .05 [90% CI: .050, .059]; SRMR = .08; WRMR = 1.44. All the items were statistically significant, with their standardised factor loadings ranging from .19 (iD10) to .89 (iCWB7), and there was no evidence of large standard errors.

Not completely satisfied with the incremental fit of the model, I embarked on a specification search to detect potential specification errors. Inspection of the modification indices suggested that, if I allowed item iD1 ("It's not wise to tell your secrets" — *Machiavellianism*) to load onto *Psychopathy*, there would be an approximate 103 unit change (decrease) in the chi-square value. One of the characteristics of individuals with psychopathic traits is thrill-seeking behaviour (Paulhus & Williams, 2002), and one might easily get a thrill from withholding a secret from someone, which is why this particular *Machiavellianism* item may want to load onto *Psychopathy*. In conjunction to this speculation, researchers have indeed found that the Dark Triad shares a lot of overlapping information (Lyons & Brockman, 2017; Pailing et al., 2014). Therefore, I felt I had sufficient grounds to apply this modification to the model.

A new measurement model (ModelDT1) was run that excluded one item (iD10) that had previously shown a low standardised factor loading of .19 (R^2 = .04), and which consisted of the modification in which item iD1 was allowed to cross-load onto *Psychopathy*. ModelDT1 showed improved fit: $X^2_{(317)}$ = 733.75; CFI = .92; TLI = .91; RMSEA = .05 [90% CI: .045, .054]; SRMR = .07; WRMR = 1.30. All the items were statistically significant, with their standardised factor loadings ranging from .35 (iSU1) to .90 (iCWB7). The standard errors were small, and the statistically significant correlations between the latent factors were as follows: .30 (Dark Triad ~~ *Self-undermining*), .37 (Dark Triad ~~ *CWB-I*), and .62 (*Self-undermining* ~~ *CWB-I*).

Following the measurement model, I ran the hypothesised structural model with the direct and indirect relationships included. The Dark Triad (total) was the independent variable, *Self-undermining* was the mediator, and *CWB-I* was the dependent variable. The hypothesised structural model showed that there was an indirect relationship between the Dark Triad (total) and *CWB-I* through *Self-undermining behaviour*. That is, self-undermining mediated the relationship between the Dark Triad (total) and CWB-I, providing support for Hypothesis 11d. ModelDT1 demonstrated good reliability (ωh = .82). Figure 27, below, depicts the structural paths with the standardised estimates between the latent constructs. The estimates between the three dark traits and Dark Triad (total) are unstandardized.

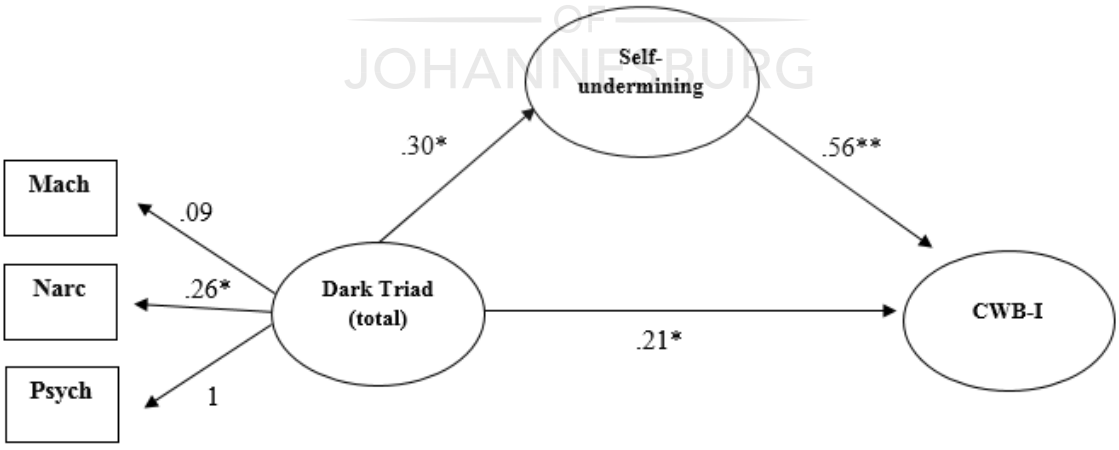

Figure 27. Path diagram between *Dark Triad* (total), *Self-undermining* and *CWB-I*

Below, Table 20 shows the indirect effects for all the structural equation models with both the standardised and unstandardized estimates included. The 95% confidence intervals within which the indirect effects fell are also provided. As can be seen, all Big Five personality traits were significant predictors of job performance through job crafting behaviour as a mediating variable. In terms of the Dark Triad, only psychopathy was a significant predictor of job performance through self-undermining behaviour when analysed as separate dark traits. Interestingly, when the Dark Triad was computed as a higher-order construct, the Dark Triad (as a whole) predicted job performance through self-undermining behaviour.

Table 20

Test of Unique Indirect Relations

							95 % CI of the Indirect Effects	
Predictor	Mediator	Criterion	β	Estimate	SE	*P*	Lower	Upper
Big Five								
Extraversion	Relational Crafting	OCB-I	.14	.18	.04	.000	.10	.26
Agreeableness	Relational Crafting	OCB-I	.10	.14	.03	.000	.07	.20
Conscientiousness	Task Crafting	IRB	.06	.07	.03	.005	.02	.12
Openness	Task Crafting	IRB	.07	.09	.03	.001	.04	.16
Neuroticism	Relational Crafting	OCB-I	-.09	-.11	.03	.000	-.17	-.05
Dark Triad								
Machiavellianism	Self-undermining	CWB-I	-.07	-.13	.07	**.069**	-.27	.01
Psychopathy	Self-undermining	CWB-I	.19	.24	.04	.000	.15	.32
Narcissism	Self-undermining	CWB-I	-.00	-.01	.09	**.952**	-.19	.17
DT (total)	Self-undermining	CWB-I	.17	.16	.06	.005	.05	.28

Note. Values in bold indicate non-significance

3.5 DISCUSSION

While extant research has investigated the direct personality–performance relationship, little research exists that focused on the indirect ways in which personality may affect job performance. In particular, the behavioural mechanisms (i.e. processes) that employees use to express their personality traits at work and which have implications for their subsequent job

performance are still largely undisclosed. Accordingly, the current study set out to investigate the *indirect* relationship between personality and performance through two specific employee behaviours, namely job crafting and self-undermining behaviour. The study generally hypothesised that 1) the Big Five personality traits would indirectly affect job performance (i.e. in-role behaviour and OCB) through job-crafting behaviour; and 2) the Dark Triad personality traits would indirectly affect job performance (i.e. CWB) through self-undermining behaviour. In sum, the study revealed that an individuals' personality does indirectly affect their job performance through job crafting and self-undermining behavioural processes, with the effect sizes falling within the moderate range. In what follows, the most important findings and contributions of the study are discussed.

3.5.1 Reliability of the Measurement Instruments

Using Nunnaly and Bernstein's (1994) recommendations for assessing scale reliability, most of the scales used in the present study showed good internal consistency and were deemed reliable measures of their respective constructs. The SD3 (Jones & Paulhus, 2014), which measures the three dark traits of Machiavellianism, psychopathy and narcissism, however, yielded questionable reliability when measured as three distinct traits. This finding is contrary to previous research that found the SD3 to demonstrate moderate to good reliability (e.g., Baughman et al., 2012; Jones & Paulhus, 2014). It is worthy of noting that research concerning the Dark Triad, using the SD3, has mainly been conducted in international contexts (e.g., Canada, USA, Austria, and Germany) that did not include South Africa.

It is possible that the native (i.e. Western) nature of the SD3 presents conceptual differences for individuals residing in the multicultural context of South Africa, therefore leading to lower-than-desired reliability scores. Perhaps personality researchers wishing to measure the malevolent and socially aversive side of personality (i.e. the Dark Triad) amongst South African individuals should opt for personality measures that have been adapted or developed specifically for the South African population, as was the BTI (see Taylor & De Bruin, 2006), which proved to be a reliable measure of the Big Five in the current study. According to Kanjee and Foxcroft (2009), "the adaptation of assessment measures is essential in a multicultural and multilingual society like South Africa if test results are to be valid and reliable for all test-takers" (p. 77). I offer a potential alternative to the SD3, namely the Work-related Risk and Integrity Scale (WRISc) (Van Zyl & De Bruin, 2016), which was specifically designed to index

the Dark Triad of personality for South African individuals. The WRISc has demonstrated good construct validity and reliability, even under the strict parameters of the Rasch measurement model (see Van Zyl & De Bruin, 2018).

3.5.2 FFM → Job Crafting → Job Performance

In stark contrast to research on the outcomes of engaging in job-crafting behaviour, research concerning the individual antecedents that promote or encourage job crafting are not well known (Berdicchia et al., 2016). The present study investigated whether personality, as measured by the Big Five, predict individuals' job-crafting behaviour and their subsequent job performance. The findings that emerged from the SEM analyses largely supported the study's hypotheses. That is, all Big Five personality traits were found to predict job-crafting behaviour, which, in turn, predicted job performance. These findings lend support to the scant amount of previous research that has found individual characteristics (i.e. personality) to predict job-crafting behaviour (Bakker et al., 2012; Bell & Njoli, 2016), and also provides empirical backing to theoretical argument of Oldham and Fried (2016), that employees respond differently to their job characteristics as a function of their personalities. Furthermore, consistent with previous literature (e.g., Demerouti, Bakker, & Halbesleben, 2015; Leana et al., 2009; Gordon et al., 2015; Tims et al., 2013; Tims et al., 2015), the present study also found that employees can indeed use job crafting to increase their job performance.

In terms of the specific personality traits that make up the Big Five, results showed that employees with high levels of extraversion and agreeableness engage in relational crafting behaviour, which, in turn, leads to increased self-reports of OCB-I. With respect to the direct positive relationships between extraversion and relational crafting, and agreeableness and relational crafting respectively, the findings contradict those of Bell and Njoli (2016), who found that extraversion and agreeableness were negative predictors of job crafting (total) behaviour. It is startling that highly extraverted and agreeable individuals would engage less in job-crafting behaviour when the traits they possess (e.g., talkative, warm, kind, friendly, co-operative) should, in fact, facilitate and promote job crafting, especially from a relational crafting perspective. Perhaps investigating the predictive validity of extraversion and agreeableness on a total job-crafting score (as was done by Bell and Njoli, 2016) is not as theoretically convincing as investigating their predictive validity on job crafting dimensions that are more theoretically viable, such as relational crafting. In the current study, extraversion

and relational crafting were indeed found to be positive predictors of relational crafting behaviour (Hypothesis 4a).

In terms of the indirect relationship, the findings suggest that employees who are characteristically social (e.g., talkative, warm, kind, friendly) modify their job characteristics by increasing social interaction with others at work, which leads to them going beyond their role requirements and engaging in helping behaviours (i.e. OCB-I) towards other individuals. Indeed, researchers have found that extraversion and agreeableness are positively related to the interpersonal component of contextual performance (i.e. OCB-I) (Organ & Ryan, 1995; Van Scotter & Motowidlo, 1996). This study not only supports these previous findings, but also extends them by showing that these two traits (extraversion, agreeableness) are also *indirectly* related to OCB-I through relational crafting behaviour. Furthermore, owing to the fact that the sample represented a diverse range of occupations, results from the present study show that extraversion and agreeableness are not only important for job performance in occupations that require high social interaction (e.g., Barrick & Mount, 1991; Salgado, 1997), but also across general work.

With respect to task crafting, the present study supports the proposition that employees who are conscientious and open to experiences engage in task-crafting behaviour, which, in turn, results in increased self-reports of IRB (i.e. task performance). This finding suggests that individuals who are well-organised, dependent, responsible, self-disciplined (i.e. conscientious), as well as those who are open-minded, creative, and willing to try new things (i.e. open to experiences) are more likely to shape the physical aspects of their jobs to experience a better fit between their own personal characteristics and the characteristics of the job, which, in turn, yields positive returns for their IRB. The positive association between job crafting and IRB (i.e. task performance) corroborates previous job-crafting research (Demerouti, Bakker, & Halbesleben, 2015; Weseler & Niessen, 2016). Secondly, it supports the idea that employees can use job crafting (i.e. task crafting) as a strategy to positively influence their work environment and work experiences, which may contribute to more favourable work outcomes such as increased job performance (Oldham & Hackman, 2010; Tims, Bakker, & Derks, 2014).

The final Big Five trait that was explored in relation to job crafting and job performance was neuroticism. The results supported the hypothesis that there is an indirect negative relationship

between neuroticism and OCB-I through relational crafting behaviour (Hypothesis 7b). Perhaps, due to their general negative affect and/or their inability to control their emotions (McCrae & Costa, 1987), highly neurotic individuals are less likely to be successful at establishing relationships with others at work through, for instance, relational crafting, which, in turn, leads to them being less likely to go beyond their task requirements by helping others or engaging in OCB towards other individuals. Although the relationship between neuroticism and relational crafting has not been studied (with the exception of Bell and Njoli (2016), whose results need to be interpreted with extreme caution), research has found that individuals who score high on *Neuroticism* report less satisfaction with their relationships at work (Scollon & Diener, 2006), substantiating why the current study observed a negative relationship between neuroticism and relational crafting. Lastly, the results further support previous research that found a negative relationship between neuroticism and job performance (Barrick & Mount, 1991; Rothman & Coetzer, 2003; Tett et al., 1991).

3.5.3 Dark Triad → Self-undermining → Job Performance

One of the limitations of the FFM is that it does not account for the dark side of human nature (Ashton & Lee, 2007; Veselka et al., 2012). As the present study investigating how an individual's personality predicts behavioural self-undermining and subsequent CWB-I, which are somewhat 'dark constructs,' it was deemed necessary to work from a taxonomy of personality that was thought to be most theoretically linked to these two constructs, hence the use of the Dark Triad (Paulhus & Williams, 2002).

Results obtained from the SEM analyses showed that, when analysed as separate traits, only *Psychopathy* yielded a statistically significant relationship with self-undermining, supporting previous claims that psychopathy is the most malevolent trait of the Dark Triad (Rauthmann, 2012). In particular, psychopathy was shown in the present study to indirectly affect CWB-I through self-undermining behaviour (Hypothesis 11b). This finding suggests that individuals who are impulsive, revengeful, and thrill-seeking (Hare, 1985) are more likely to undermine themselves at work (i.e. create conflict and rivalry with co-workers, harm professional relationships, disregard organisational rules), which, in turn, may fuel counterproductive behaviours that are harmful to others (i.e. CWB-I), such as ignoring, insulting, and arguing with others. This finding accords with statements made by Babiak and Hare (2006) and Boddy (2010), that individuals who possess psychopathic traits may engage in dysfunctional

behaviours that are destructive to their colleagues and the larger organisation. The present study showed that one of the many dysfunctional behaviours that corporate psychopaths or 'snakes in suits' may engage in is behavioural self-undermining, which, according to Bakker and Costa (2014), may negatively impact their job performance.

It is difficult to explain why Machiavellianism and narcissism did not predict self-undermining and CWB-I, but it might be that Machiavellians and narcissists employ workplace tactics that undermine those around them (e.g., social undermining) and not necessarily themselves (e.g., self-undermining). As noted by Spain et al. (2014), Machiavellians hold no emotional attachment, leading them to exploit others through dishonest and deceptive strategies, while Deshong et al. (2015) argue that narcissists fantasise about success and exercising control over others. What was surprising, however, was that the results showed narcissism to positively relate to all forms of job-crafting behaviour, suggesting that narcissists may instead use job crafting as a workplace strategy to get ahead of others and perhaps increase their job performance. An alternative explanation is that Machiavellian and narcissistic personality traits may not be easily detectable at a single point in time (i.e. in a cross-sectional study), and it may just be that these traits are only revealed over a longer term. Thus, longitudinal studies on this phenomenon may prove particularly useful.

Interestingly, when the Dark Triad was measured as a higher-order construct or total 'dark core,' as has been suggested by previous researchers (e.g., Bertl et al., 2017; Jonason et al., 2010), increased reliability and statistically significant relationships were found, both in the correlation and SEM analysis. With respect to the SEM results, the Dark Triad (total) indirectly related to CWB-I through self-undermining behaviour (Hypothesis 11d). In particular, increased scores on the Dark Triad (total) predicted increased scores on *Self-undermining*, which, in turn, predicted increased scores on *CWB-I*. This finding suggests that individuals scoring high on the Dark Triad (total) (i.e. individuals who are grandiose, impulsive, thrill-seeking, and manipulative) or who possess a common 'dark core,' are more likely to undermine themselves at work by creating obstacles (e.g., conflict, stress, confusion), which, in turn, will lead to these individuals reporting more maladaptive organisational behaviours (*CWB*s). The results confirmed that there is an association between self-undermining and job performance. For example, in Bakker and Wang's (in press) study, self-undermining was found to negatively relate to supervisor ratings of job performance (i.e. task-crafting/IRB). The study extends these

findings by showing that self-undermining is also related to the negative aspect of job performance, namely CWB. Finally, the findings corroborate previous observations that the Dark Triad is positively related to CWB (Bennet & Robinson, 2000; DeShong et al., 2015; O'Boyle et al., 2012; Paulhus & Williams, 2002; Penny & Spector, 2002). However, the present study demonstrated that the Dark Triad can also affect CWB *indirectly*.

3.5.4 Practical Implications and Contributions of the Study

Job crafting and self-undermining have important implications for an individual's job performance (Bakker, 2015; Bakker & Costa, 2015; Bakker & Wang, in press; Gordon et al., 2015; Tims et al., 2015; Wesseler & Niessen, 2016), making it imperative that organisations understand the factors that predict or drive such behaviours. The study showed that an individual's disposition (i.e. personality) influences the behaviours that he or she engages in at work, which, in turn, have implications for their subsequent job performance. Based on the findings, it is suggested that organisations encourage and promote job-crafting practices as a workplace strategy that employees can use to express their personality traits and improve their job performance, and, at the same time, employ effective strategies to detect and flag individuals who possess dark traits (especially psychopathy), as these individuals may engage in deviant behaviours (i.e. self-undermining, CWB) that can be both costly and harmful to employee and organisational performance. The study indicates the need for organisations to take special consideration of an individual's personality (i.e. personal disposition) when making important selection and placement decisions.

The study contributes to the existing literature in a number of ways. The first contribution is that personality can indeed affect job performance *indirectly*, supporting previous claims that personality is an indirect determinant (Johnson & Schneider, 2013). According to Beaty et al. (2001), research reporting the direct personality–performance relationship is often small in magnitude, and it may be that there are underlying behavioural mechanisms (i.e. mediators) that can better explain the association between these two constructs. As was shown in the current study, job crafting and self-undermining can help explain the indirect relationship between personality and job performance. With respect to job crafting, little research exists that explored its individual antecedents (Berdicchia et al., 2016). Research concerning the antecedents of job crafting has mainly focused on contextual factors (see Ghitulescu, 2006; Leana et al., 2009). The present study showed that individuals' personality (i.e. Big Five)

undeniably influences their job-crafting behaviour, thereby contributing to the small amount of research that has explored personality as an antecedent of job-crafting behaviour (Bakker et al., 2012; Bell & Njoli, 2016). In doing so, the present study answers calls to investigate the individual antecedents that promote job-crafting behaviour (Oldham & Fried, 2016; Vogt et al., 2016; Wrzesniewski & Dutton, 2001).

Regarding the 'dark side,' questions have been raised as to "whether the effect of the DT on CWB is more a direct effect or an indirect effect brought about through other organisational factors" (Baloch et al., 2017, p. 8). Although there was evidence of a direct relationship, the present study showed that the Dark Triad can also affect CWB indirectly. According to Cohen (2016), there is limited information surrounding the determinants of CWB, and the findings of the present study thus contribute to the scant research that has investigated the Dark Triad as an antecedent of CWB (e.g., Baloch et al., 2017; O'Boyle et al., 2012; Penny & Spector, 2002). Regarding self-undermining behaviour, the results showed that the Dark Triad plays an influential role in predicting behavioural self-undermining. This research is the first to look at the individual antecedents of self-undermining behaviour and is therefore another contribution of the present study. According to Harms and Spain (2015), research concerning the implications of the Dark Triad for important workplace outcomes has only recently begun to enter the mainstream of organisational research; thus, the findings of the present study also contribute to this area, which suffers from a dearth of empirical research. Furthermore, the study contributes to the limited body of job-crafting and self-undermining research that has been conducted within South Africa. The final contribution relates to the measurement of the Dark Triad within a non-Western context. To my knowledge, there are no studies that have used the SD3 (Jones & Paulhus, 2014) to measure the dark side of personality amongst South African working individuals; this is therefore another contribution of the present study.

3.5.5 Limitations and Recommendations for Future Research

There are a few limitations to the current investigation worthy of acknowledging. The first is the self-report nature of the questionnaires, which is known to introduce common method variance (CMV). CMV is a problem particularly relevant to behavioural research, as it has the ability to compromise the validity of conclusions derived from a study (*cf.* Podsakoff, MacKenzie, & Lee, 2003). In the current study, the chances of CMV occurring were reduced, as different scale response formats were used across the measurement instruments (see

Podsakoff et al., 2003). Another limitation is that the study was unable to explain why Machiavellianism and narcissism were not found to be related to self-undermining and CWB. I believe that it could be one of many things, such social desirability, test length, reverse-scored items, or the temporal nature of the data collection procedure. It may also be due to the questionable construct validity of the SD3 that was used to measure dark personality traits. I elaborate on these points below, and offer a number of remedial techniques for future researchers, based on Podsakoff et al.'s (2003) recommendations.

First, individuals may be afraid to report their true standing on dark constructs such as Machiavellianism and narcissism, in order to present themselves in a more favourable light (Heneman et al., 1997; Tedeschi & Reiss, 1981). Future researchers could consider using alternative rating sources (i.e. supervisor, colleague) when measuring dark constructs such as the Dark Triad. Second, considering that many constructs were measured in the current study (i.e. Big Five, Dark Triad, job crafting, self-undermining, IRB, OCB, and CWB), respondents may have found the length of the survey quite long, which may have affected their responses to questions on Machiavellianism and narcissism. Podsakoff et al. (2003) posit that test length can affect respondents' responses. Accordingly, future researchers may want to use shorter personality measures to keep test length to a minimum; however, they are encouraged to exercise caution in doing so, as it has been found that shorter personality tests can yield unsatisfactory reliability when compared to longer personality measures (see Metzer, De Bruin, & Adams, 2014). Third, some of the SD3 items were reverse-scored, which could have introduced some confusion and affected respondents' responses to these items (Netemeyer et al., 2003; Taylor, 2004). To avoid this problem, it is recommended that researchers use measures that contain only positively scored or worded items, which, according to Metzer et al. (2014), cause less confusion and enable respondents to quickly understand the content of the items. Finally, the design of the study was cross-sectional in nature (which, in itself, is a limitation, as causality cannot be assigned), with scores on Machiavellianism and narcissism being taken at a single point in time. It could be that these traits present themselves in the long run, and so it is recommended that future researchers consider the issue of methodological measurement separation (for a discussion on this, see Podsakoff et al., 2003). In particular, researchers may want to create temporal separation by introducing time lags between the measurement of the predictor (the Dark Triad) and criterion variable respectively, so that

respondents avoid making links or associations between the respective constructs. This, however, may not be possible when time is limited.

The next limitation of the study relates to the level at which the statistical analyses were conducted. The Big Five and the Dark Triad traits were analysed at the general or trait level. The analysis did not consider the facets within each factor or trait. It may be worthwhile for future researchers to look at the deep facet composition level to gain a better understanding of personality as a predictor of job crafting and self-undermining behaviour and their subsequent effects on job performance. As stated by Goldberg and Saucier (1990), "a better way to understand each factor might be to characterize its crucial subcomponents" (p. 14). The present study also did not consider any potential moderating variables that could have strengthened or weakened the personality–performance relationship. It may be worthwhile for future researchers to consider moderators that may strengthen or weaken the magnitude of the relationships, or the variances accounted for in each respective personality–performance relationship. As previous research has shown, certain personality traits (e.g., extraversion and agreeableness) are only important in certain contexts, such as sales (e.g., Barrick & Mount, 1991). Barrick and Mount (1993) demonstrated that personality predicted managerial performance when autonomy (moderator) was high. Future researchers may therefore want to consider the type of work, job level, or industry that an individual works in as potential moderating variables, which may, or may not, strengthen or weaken the personality–performance relationship.

The next recommendation deals with the measurement of the Dark Triad. As evidenced in the statistical analyses, the measurement of the Dark Triad presented a number of issues in the current investigation. In particular, results from the parallel analysis showed that four factors instead of three were present in the data, leading to speculations surrounding the construct validity of the SD3. Interestingly, in the development study of the SD3, Jones and Paulhus (2014) performed a parallel analysis and also found four factors to be present. They continued to state that there was ambiguity with regard to how many factors to extract in their first study (p. 32), and thus employed exploratory SEM in subsequent analyses, as it was considered a less stringent approach than traditional confirmatory factor analysis, which according to them, is unlikely to result in a fitting model. In the current study, a number of items belonging to the three dark traits (i.e. Machiavellianism, psychopathy, narcissism) cross-loaded or did not load

at all, and it is thus recommend that future researchers explicitly investigate the construct validity of the SD3 in the South African work context. As it stands, only 17 items from the original 27 items of the SD3 can be used to measure the dark side of personality amongst South African employees.

A final recommendation that future SEM researchers should take into consideration is the utility of modification indices in improving model fit. As was demonstrated in the current research, when the fit of the implied theoretical model is not as strong as desired, model modifications may prove to be particularly useful. Future researchers wishing to investigate the relationships between the variables used in this study should consider undertaking a thorough investigation of model parameters (including the residual matrix) to determine whether specification errors exist that may be causing model misfit. However, it is imperative to ensure that model modifications are guided by practical significance and substantive meaning (Schumacker & Lomax, 2010).

3.5.6 Conclusion

Previous research has neglected the indirect ways through which personality can affect job performance. The present study showed that an individual's personality, as measured by the Big Five and Dark Triad, indirectly affects their job performance through two specific behavioural processes, namely job crafting and self-undermining. Employees express their personality traits by engaging in job crafting and self-undermining behaviour, which in turn, has implications for their job performance.

CHAPTER 4:

JOB CRAFTING: AN EFFECTIVE JOB ENGINEERING TECHNIQUE THAT CAN SATISFY BASIC PSYCHOLOGICAL NEEDS AND IMPROVE PERSON–JOB FIT AT THE WEEK LEVEL

ABSTRACT

Job crafting as a proactive self-initiated form of employee behaviour, presents a number of positive benefits for employees, such as increased work engagement, work meaning, and job performance, to name a few. To date, however, there limited multilevel research has been conducted that explored job crafting as a workplace strategy that can satisfy or fulfil individuals' basic psychological needs, which are considered essential to their ongoing development and wellbeing. Drawing from self-determination theory and using multilevel mediation, a weekly diary study was performed to test the indirect effect of weekly job-crafting behaviour on weekly person–job fit (P-J fit) through weekly need satisfaction as a mediating variable. Data were collected amongst a diverse group of South African employees (n = 144) every Friday, for four consecutive weeks (n = 576 occasions). On the Friday of each work week, employees reported their job-crafting behaviour, the extent to which their basic needs were satisfied, and their perception of how well they fit their job in that week. Overall, the results showed that weekly job crafting (i.e. task crafting and cognitive crafting) has a positive indirect effect on weekly P-J fit via basic needs satisfaction (i.e. competence and autonomy need satisfaction). The findings suggest that employees can use job-crafting practices on a weekly basis to fulfil their basic psychological needs and subsequently improve their fit to the job.

Keywords: job crafting, needs satisfaction, person–job fit, diary study

4.1 INTRODUCTION

Work is and always will be a fundamental part of human life. Apart from survival, compensation, and a reason to get out of bed every morning, work provides people with a sense of belonging and plays a central role in the development and sustenance of their psychological

health and well-being (Blustein, 2008). Work not only consumes a considerable portion of our waking lives, its effects can easily spill over into our personal or family lives (Mennino, Rubin, & Brayfield, 2005; Moen, Fan, & Kelly, 2013), which necessitates the need to have positive workplace experiences.

While organisations play an important role in cultivating positive workplace experiences for their employees — which they do so through the implementation of employee wellness programmes, flexible work arrangements, and paid leave, to name a few — employees themselves have the ability to proactively shape, influence, and customise their own work experiences (Bakker, 2017; Oldham & Hackman, 2010; Wrzesniewski & Dutton, 2001). In fact, in today's global economy, where the nature of work is constantly changing, and the workplace is characterised by the effects of globalisation, competition, and the introduction of new technologies, employees are called upon to take up a more proactive role in organisational life by initiating and demonstrating more proactive behaviours at work (Erdogan & Bauer, 2005; Tims, & Kooij, 2013). Oldham and Hackman (2010) further maintain that, these days, changes to the scope of the job "do not necessarily have to wait for managers to take the initiative" (p. 490). That is, employees can make changes to their job and reap the positive work experiences derived from such changes at their own discretion. One particularly useful approach that employees can use to customise their jobs and overall work experience is job crafting.

Job crafting is an informal approach to job design that captures the positive self-initiated changes employees make to their job features (Slemp & Vella-Brodrick, 2014). The concept was first introduced as "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (Wrzesniewski & Dutton, 2001, p. 179), and later framed within job demands–resources (JD-R) theory (Bakker & Demerouti, 2014) as the proactive changes employees make to align their job demands and job resources with their own needs, skills, and abilities (Tims, Bakker, & Derks, 2012). Attributable to the beneficial effects that it has for both employees and organisations at large, job crafting has come to be seen as an exciting area of research, and this research interest is predicted to increase substantially in the years to come (*cf.* Oldham & Hackman, 2010).

Wrzesniewski and Dutton (2001) originally proposed a model of job crafting that stressed the individual motivations for engaging in this proactive form of employee behaviour. According

to the model (p. 182), individuals craft their work because of three primary needs: the need to have control over the job, the need for a positive self-image, and the need for human connection with others. The three needs proposed by Wrzesniewski and Dutton are well-positioned within self-determination theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000), a macro theory of motivation that proposes three innate basic psychological needs that human beings have and strive to satisfy, namely the need for autonomy (i.e. control over the job), the need for competence (i.e. a positive self-image), and the need for relatedness (i.e. human connection with others). It is argued that, when these three needs are met or satisfied, the individual reaps a number of positive benefits, including, but not limited to, psychological growth and adjustment, optimal functioning, and improved wellbeing (Deci & Ryan, 1985; Ryan & Deci, 2000; Van den Broeck, Ferris, Chang, & Rosen, 2016). Hence, it is imperative that managers and organisations understand the precursors or antecedents that lead to the satisfaction of these needs.

To date, there few research studies have investigated the behavioural antecedents that lead to the satisfaction of the three needs, particularly within work settings (*cf.* Slemp & Vella-Brodrick, 2014). Interestingly, researchers proclaim that employees can use job crafting as a means to satisfy or fulfil the three needs (Bakker & Van Woerkom, 2017; Slemp & Vella-Brodrick, 2014; Tims, Derks, & Bakker, 2016; Wrzesniewski & Dutton, 2001). Using SDT as the theoretical backdrop, a weekly diary study was employed in the present study to investigate the relationship between job crafting and need satisfaction over time (four weeks). The study explored whether employees can use weekly job-crafting behaviour to satisfy their weekly needs for autonomy, competence, and relatedness, and in so doing, confirm or disconfirm previous claims made regarding the job crafting–needs satisfaction relationship. Wrzesniewski and Dutton (2001) propose that job crafting is not a single or once-off event, and that the jobs employees hold are actually being recreated or crafted all the time; thus, a weekly diary study seemed an effective approach to capture the dynamic, fluctuating, and ongoing nature of job-crafting behaviour. According to Petrou and colleagues (2012), the strength of diary methods are particularly relevant in studying job-crafting behaviour, and the past decade has witnessed a sharp increase in the amount of diary studies to study job-crafting behaviour (e.g., Petrou, Bakker, & Van den Heuvel, 2017; Petrou & Demerouti, 2015; Petrou, Demerouti, Peeters, Schaufeli, & Hetland, 2012; Rofcanin, Bakker, Berber, & Gölgeci, 2018). With regard to the three basic psychological needs, previous studies have shown daily variations in need

satisfaction as a result of daily activity (see Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996), offering further support for a weekly-diary design.

As a creative workplace strategy, job crafting is primarily aimed at increasing the fit or alignment between the individual and the job (Tims, Bakker, & Derks, 2012; Tims, Bakker, & Derks, 2015a), or what Kristof-Brown, Zimmerman, and Johnson (2005) refer to as *person–job fit* (P-J fit). P-J fit can be loosely defined as the extent to which individuals perceive a match between their personal characteristics and the characteristics of the job (Ehrhart & Makransky, 2007). While a substantial body of evidence confirms job crafting to be associated with a number of positive work-related outcomes such as job satisfaction (e.g., Cheng, Chen, Teng, & Yen, 2016; De Beer, Tims, & Bakker, 2016), work engagement (e.g., Harju, Hakanen, & Schaufeli, 2016; Vogt, Hakanen, Brauchli, Jenny, & Bauer, 2015) and job performance (e.g., Gordon, Demerouti, Le Blanc, & Bipp, 2015; Weseler & Niessen, 2016), the relationship between job crafting and P-J fit has received far less research attention (*cf.* Tims, Derks, & Bakker, 2016).

Similar to job crafting, P-J fit has also been shown to be a state-like variable that fluctuates on a weekly basis (see Tims et al., 2016). Indeed, Walsh and Gordon (2008) argue that individuals regularly evaluate the fit between themselves and the job, which also makes a weekly diary study an optimal research design to capture the dynamic nature of P-J fit over time. Accordingly, the present study also investigated the *indirect* relationship between weekly job crafting and weekly P-J fit through weekly needs satisfaction as a mediator. It is argued that, when employees' weekly needs are satisfied through weekly job-crafting activities, they experience a better weekly fit between their personal characteristics and the characteristics of the job. By exploring needs satisfaction as a mediator, the study unearthed the mechanisms by which job crafting can improve P-J fit, which, to date, have received little research attention. The hypothesised research model is depicted in Figure 28, below.

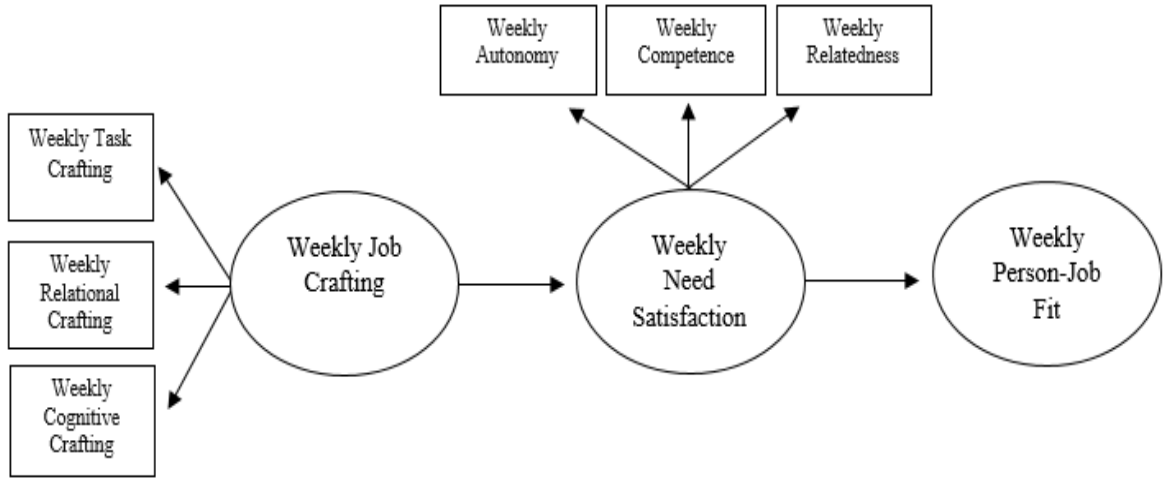

Figure 28. Hypothesised Research Model

4.2 LITERATURE REVIEW

4.2.1 Self-determination Theory: Basic Psychological Needs

Understanding what motivates individuals at work has been an ongoing quest for many decades, since motivation is what drives individuals to behave and act in the ways they do, and is the very reason for them wanting to engage in or disengage from a particular behaviour. Motivation includes all the aspects (i.e. energy, persistence, and direction) that are responsible for activation and intention (Ryan & Deci, 2000), and is an important construct and critical issue for both employees and organisations, primarily due to its consequences. The concept has been found to be positively associated with aspects such as job performance, organisational revenue, and employee wellbeing (see Steers, Mowday, & Shapiro, 2004), to name a few. SDT is a theory of human motivation that features prominently in organisational behaviour literature, and is often used to explain the internal motivations that underlie individuals' choices and actions (Deci & Ryan, 1985; Ryan & Deci, 2000).

No extant need frameworks and motivation theories (e.g., Maslow, 1943; McClelland, 1965) have drawn as much research attention as SDT (*cf.* Van den Broek et al., 2016). SDT has been used extensively in organisational research to explain how individuals' motivations and needs are related to and predicted by various features within the work environment. For example, Bakker and van Woerkom (2017) used SDT to explain how employees can use self-determining strategies such as job crafting to satisfy their needs and subsequently increase their

work-related flow and job performance. De Gieter, Hofmans, and Bakker (2017) recently conducted a daily diary study amongst a sample of Belgium social-service employees, and used SDT to explain how psychological needs satisfaction mediates the relationship between job characteristics (i.e. job demands and job resources) and job outcomes (i.e. strain and performance). Moreover, findings from a cross-cultural study found support for a SDT model in which an autonomy-supportive organisational culture predicted overall needs satisfaction, which, in turn, predicted task engagement and employee wellbeing (Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001). Taken together, it is plausible to argue that there is strong utility in using SDT to explain various employee behaviours and outcomes.

While SDT recognises human beings as inherently proactive, having the natural inclination or tendency to act on rather than being controlled by internal and external forces (Deci & Vansteenkiste, 2004), the central feature of SDT is its recognition of three basic psychological needs. According to SDT, there are three basic psychological needs that serve as the basis for each and every individual's self-motivation: the need for autonomy, the need for competence, and the need for relatedness. The three needs, commonly referred to as 'nutriments' (Baard, Deci, & Ryan, 2004; De Gieter et al., 2017), are considered innate, universal, and essential for the psychological functioning, survival, growth, and wellbeing of individuals (Deci & Ryan, 1985; Gagné & Vansteenkiste, 2013; Ryan & Deci, 2000). *Need for autonomy* denotes feeling a sense of choice or volition, where the individual is a causal agent or initiator of his or her own actions and outcomes (Deci, 1975; Slemp & Vella-Brodrick, 2014). It suggests being in control and having latitude to exercise discretion over one's own decisions (Funder, 2010). The *need for competence* is concerned with the feeling of succeeding at an optimally challenging task and being able to attain desired outcomes (Baard et al., 2004). White (1959) explains the need for competence as the individual's need to feel a sense of mastery over the environment and the need to develop new skills. Lastly, the *need for relatedness* concerns the need to be cared for and establishing mutual respect and reliance with other individuals (Baumeister & Leary, 1995). Funder (2010) refers to the need for relatedness as the need to establish satisfying and meaningful social ties.

Just like plants require sunshine, minerals, and water to survive and flourish (*cf.* Van den Broeck, 2016) , human beings require these three basic psychological needs to be satisfied in order to remain fully functional and to experience improved mental health and wellbeing

(Funder, 2010; Gagné & Vansteenkiste, 2013; Ryan & Deci, 2000). Slemp and Vella-Brodrick (2014) advocate that "the extent to which the three needs are satisfied in the workplace determines the level of wellbeing that employees experience" (p. 960). While the present study did not look at specific wellbeing outcomes, such as job satisfaction, work engagement, and psychological meaningfulness, it did consider the influential effect that needs satisfaction has on an important work outcome, P-J fit, which research has indeed found to be directly related to employee wellbeing (e.g., Lin, Yu, & Yi, 2014; Tims, Derks, & Bakker, 2016; Warr & Inceoglu, 2012). In the sections that follow, job crafting is presented as a new and exciting construct that employees can use to not only satisfy their weekly needs for autonomy, competence, and relatedness, but also increase their weekly perception of P-J fit.

4.2.2 Job Crafting as a Means to Satisfy Basic Psychological Needs

Job crafting can be viewed as a type of job-engineering technique that employees can use to shape and optimise their overall work experience (Bakker, 2017). Using JD-R theory (Bakker & Demerouti, 2014), Demerouti (2014) conceptualises job crafting as a distinct type of employee behaviour that consists of employees initiating changes in the level of job demands and job resources in order to improve the design of the job and foster a more meaningful, engaging, and satisfying work experience. Unlike traditional top-down approaches to job design (e.g., job enlargement, job enrichment), job crafting is a bottom-up approach to job design that captures the proactive self-initiated changes that employees (not management) make to both their physical and cognitive job features (Wrzesniewski & Dutton, 2001). With regard to physical changes, employees may alter their actual work tasks by changing the scope, nature, and manner in which these tasks are performed, which has been labelled *task crafting*. Employees can also physically change the amount and quality of social interaction they have with others at work, which has been referred to as *relational crafting.* The third and final form of job crafting, originally proposed by Wrzesniewski and Dutton (2001), relates to the cognitive changes employees make to their jobs, whereby they change their perceptions about their job and see their job as a more integrated and meaningful whole, which has been termed *cognitive crafting*.

In all its various shapes and forms, job crafting research has consistently shown that employees can craft their job to increase the meaning they derive from their work (e.g., Peral & Geldenhuys, 2016; Tims, Derks, & Bakker, 2016; Wrzesniewski & Dutton, 2001), their work

engagement (e.g., De Beer, Tims, & Bakker, 2016), and their overall job performance (e.g., Weseler & Niessen, 2016). Interestingly, Harju, Hakanen, and Schaufeli (2016) found that job crafting can even be used to combat the effects of job boredom. Research has also found strong utility in the application of job crafting interventions within organisations. For example, Gordon, Demerouti, Le Blanc, Bakker, Bipp, and Verhagen (2018) tested the effects of a job-crafting intervention on a sample of healthcare workers, and found that it had a positive effect on both their wellbeing and job performance. Another study investigated the longitudinal impact of a job-crafting intervention amongst a sample of primary school teachers (see Van Wingerden, Bakker, & Derks, 2016). One year after the job crafting intervention had been employed, employees reported a significant increase in their performance feedback, opportunities for professional development, self-efficacy, and job performance.

Notwithstanding the several lines of evidence that clearly demarcate the positive association between job crafting and various employee- and organisational outcomes, there is still relatively scant research that explored the direct relationship between job crafting and the three basic psychological needs proposed by SDT (Deci & Ryan, 2000). This is concerning, since the founders of job crafting, Amy Wrzesniewski and Jane Dutton (2001), originally proposed job crafting as a means to satisfy individuals' need for control (i.e. SDT's need for autonomy), a positive self-image (i.e. SDT's need for competence), and human connection with others (i.e. SDT's need for relatedness); little research has tested their proposition empirically. According to Deci and Ryan (1985) and Ryan and Frederick (1997), job resources (e.g., performance feedback, social support, autonomy) can fulfil basic human needs, and, since job crafting involves proactively changing one's job resources (see Tims, Bakker, & Derks, 2012), it could be expected that job crafting would satisfy individuals' psychological needs. Supporting this claim, Lyons (2008) argues that the changes employees make to their jobs through job crafting is to satisfy their *own* personal needs, and not necessarily those of the organisation. As such, in line with Bakker and Van Woerkom's (2017) conceptualisation of job crafting, the present study empirically tested weekly job crafting behaviour as a self-determination strategy that employees can use to satisfy their weekly needs for autonomy, competence, and relatedness. The type of job crafting behaviour and its hypothesised relationship with each basic psychological need is described below.

4.2.2.1 Task crafting satisfies the need for competence and autonomy

Task crafting focuses on changes employees make to their physical job tasks. Specifically, when task crafting, employees alter the type, form, or number of tasks/activities that they perform, or the manner in which these tasks are carried out (Wrzesniewski & Dutton, 2001), which results in changes to the physical design or structure of the job. Through these changes that employees make to their task boundaries, they may experience an increased sense of flow (Bakker & Van Woerkom, 2017), and may find that their work tasks are better aligned with their personal knowledge, skills, and abilities (Tims & Bakker, 2010). This increased sense of flow and improved alignment between the individual and the job is likely to facilitate a more positive self-image (Wrzesniewski & Dutton, 2001) and make the employee feel more competent or effective in performing the job (Tims, Bakker, & Derks, 2014). A hairdresser, for example, may structure or position his or her work tools (i.e. hairdryer, combs) in such a way that it allows him or her to cut the client's hair more efficiently and timeously, which, in turn, provides the hairdresser with a sense of mastery over the environment (White, 1959) and makes him or her feel more self-efficacious, and, resultantly, may satisfy his or her need for competence. Furthermore, by taking charge and being the initiator of one's own physical job changes, the employee (e.g., hairdresser) may feel autonomous and more in control of their job, and, hence, their need for autonomy may be satisfied. In a recent self-determination study (Slemp & Vella-Brodrick, 2014), a strong positive association was indeed found between task crafting, the need for competence, and the need for autonomy respectively. While studies that explored task crafting and its relationship with needs satisfaction are scarce, it was expected in the present study that, in weeks where employees crafted their task boundaries, they would feel more competent and autonomous, thereby satisfying their weekly need for competence and for autonomy. Therefore, the following was hypothesised:

Hypothesis 1: There is a positive relationship between (a) weekly task crafting and weekly competence satisfaction and (b) weekly task crafting and weekly autonomy satisfaction.

4.2.2.2 Relational crafting satisfies the need for relatedness

Wrzesniewski and Dutton (2001) proposed a type of job crafting behaviour that specifically targets relationships at work, which they refer to as *relational crafting*. As the name implies, relational crafting involves crafting (i.e. shaping, moulding, altering) one's relational boundaries, with Ghitulescu (2007) referring to it as those behaviours that capture the ways in which individuals enact the relationships they engage in at work. When employees engage in

relational crafting, they exercise discretion over how frequently they interact with others at work, whom they interact with, and the strength and quality of these interactions (Wrzesniewski & Dutton, 2001). Previous research has illustrated the importance of relational crafting for employees. For example, Rofcanin, Bakker, Berber, Gölgeci, and Heras (2018) studied relational crafting at the week level, and found that expansion-oriented relational crafting was positively related to work performance via work engagement, while contraction-oriented relational crafting showed the opposite relationship. That is, individuals who expanded their relational boundaries (i.e. increased their conversations and meetings with new colleagues) were more engaged and performed better in that week than those who contracted their relational boundaries (i.e. limited the number of meetings and conference calls with colleagues). Ghitulescu (2007) further found that relational crafting had a positive influence on teachers' levels of efficiency and job satisfaction.

Of all the three basic psychological needs proposed by SDT, relational crafting is most likely to satisfy the need for relatedness, as the need for relatedness denotes establishing meaningful social ties and mutual respect (Funder, 2010), which, in the present study, was believed to be most applicable or relevant to relational crafting behaviour. The need for relatedness or the 'need to belong' is a fundamental human need that not only features in Ryan and Deci's (1995, 2000) SDT, but also in Maslow's (1943) famous Hierarchy of Needs. According to Baumeister and Leary (1995), individuals have a strong desire to create and maintain at least a minimum quantity of interpersonal relationships. In the workplace, individuals may satisfy this desire or need for human connection through relational crafting (Wrzesniewski & Dutton, 2001). An illustrative example is a health-conscious teacher who has a strong focus on physical and mental wellbeing. Through frequent social interaction and discourse with colleagues at work, the teacher may come to learn that there are a number of other like-minded teachers that share the same interests and who are just as concerned about their wellbeing as he or she is, and as a result, begins to extend an invitation to these other teachers to join him/her on his/her routine morning jog that he/she engages in before school every morning. Through this relational crafting activity, the health-conscious teachers may begin to forge strong bonds or relationships with each another, which, in turn, satisfy their need for relatedness. Slemp and Vella-Brodrick (2014) indeed found that the need for relatedness was most strongly related to relational crafting than to task- or cognitive crafting. From the above, the following is hypothesised:

Hypothesis 2: There is a positive relationship between weekly relational crafting and weekly relatedness satisfaction.

4.2.2.3 Cognitive crafting satisfies the need for competence

In contrast to the more behavioural components of job crafting (i.e. task and relational crafting), the cognitive component of job crafting has received far less research attention, and its importance has somewhat been side-lined, primarily due to the fact that cognitive job changes cannot be observed physically. Slemp and Vella-Brodrick (2013) developed the Job Crafting Questionnaire (JCQ) that specifically targets the cognitive component of job crafting originally proposed by Wrzesniewski and Dutton (2001), as existing job crafting measures (e.g., Tims et al., 2012) fall short of tapping into this important job-crafting dimension, or do so quite vaguely. The JCQ (Slemp & Vella-Brodrick, 2013) was used in the current study to adhere to Wrzesniewski and Dutton's (2001) original three-component model conceptualisation of job crafting behaviour.

Cognitive crafting refers to changes that employees make to their cognitive job features, and basically concerns changing the way one 'sees' or perceives the job (Wrzesniewski & Dutton, 2001). It involves approaching the job with a new and positive mindset, and is an important way in which individuals can shape their work experience (Wrzesniewski & Dutton, 2001). A mechanic, for example, may shift his way of thinking from seeing his job as merely repairing cars to seeing his job as an important contribution to the safety of all commuters and pedestrians. This reframing of the job contributes to a more positive work identity and meaningful work experience (Wrzesniewski & Dutton, 2001).

The present study proposes that weekly cognitive crafting behaviour will satisfy individuals' weekly need for competence. When altering the way in which employees conceptualise their job, they are more likely to feel that their efforts make a contribution to the organisation and the greater community, and may begin to recognise the importance of their job and the value that it holds in their life (Slemp &Vella-Brodrick, 2014). This cognitive restructuring of the job may boost the self-image or work identity of the employees (Wrzesniewski & Dutton, 2001), and is likely to make them feel more capable in fulfilling their job role, and, hence, satisfy their need for competence. Indeed, of all three basic psychological needs, the need for

competence has shown to be most strongly related to cognitive crafting behaviour (see Slemp & Vella-Brodrick, 2013). Based on the aforementioned, the following is hypothesised:

Hypothesis 3: There is a positive relationship between weekly cognitive crafting and weekly competence satisfaction.

4.2.3 Job Crafting Increases P-J Fit via Basic Needs Satisfaction

As a construct, P-J fit is broadly defined as the relationship between a person's characteristics and those of the job or tasks that he or she performs at work (Kristof-Brown et al., 2005), and basically concerns the degree to which an individual and the job are compatible or 'a match. P-J fit is a specific type of fit that falls within the larger domain of person–environment (P-E) fit, which denotes the compatibility between the individual and their work environment (Kristof-Brown et al., 2005). Two sub-components or dimensions are typically used to operationalize P-J fit, namely demands-abilities (D-A) fit and needs-supplies (N-S) fit (Edwards, 1991). *D-A fit* refers to how similar the knowledge, skills, and abilities of employees are to the demands of the job, while *N-S fit* refers to the congruence between the employees' needs, desires, and preferences and the rewards obtained for performing the job (Edwards, 1991). The present study was not restricted to any specific orientations of fit, but rather used a global measure of fit that captures individuals' general perceptions of weekly P-J fit (see Saks & Ashforth, 1997).

To capitalize on the benefits of P-J fit, it is paramount that organisations understand the factors that increase fit, since it is significantly related to a number of important work-related outcomes. For instance, Kristof-Brown et al. (2005) conducted a meta-analysis of the P-J fit literature, and found that P-J fit is predictive of employees' attitudes towards their jobs and employers, and the fit they experience significantly affects their work engagement and organisational commitment levels. Farzaneh, Farashah, and Kazemi (2014) performed structural equation modelling in their study, and found that P-J fit was indirectly related to organizational citizenship behaviour through organisational commitment. Recent longitudinal evidence (Tims, Derks, & Bakker, 2016) also confirmed that P-J fit is positively related to meaningfulness over time, suggesting that individuals who optimise their P-J fit can also obtain a more meaningful work experience. These findings alone provide strong evidence that organisations should actively search for ways to promote and improve P-J fit.

Research concerning P-J fit has largely focused on the outcomes of fit, with less attention being given to the antecedents (e.g., Farzaneh et al., 2014; Greguras & Diefendorff, 2009; Kristof-Brown et al., 2005; Peng & Mao, 2015). Consequently, calls have been made for future research to examine the antecedents or drivers that lead to improved fit (e.g., Kooij et al., 2017; Kristoff-Brown et al., 2005). Recently, job crafting has surfaced as an effective workplace strategy that employees can use to optimise their fit (Lu, Wang, Lu, Du, & Bakker, 2014; Tims & Bakker, 2010; Tims, Derks, & Bakker, 2016). Since job crafting is as an attempt made by employees to adjust the job to better match their needs, skills, abilities, and preferences with the characteristics of the job (Nielsen & Abildgaard, 2012; Tims & Bakker, 2010; Tims, Bakker, & Derks, 2015), it is a type of behaviour that is focused on improving P-J fit (Tims, Bakker, & Derks, 2012; Wrzesniewski, LoBuglio, Dutton, & Berg, 2013). A recent cross-sectional investigation amongst Taiwanese workers found a positive relationship between job crafting and P-J fit (Chen, Yen, & Tsai, 2014). In another two-wave study, crafting one's physical boundaries was found to positively relate to D-A fit, while crafting one's relational boundaries was found to positively relate to increased N-S fit (Lu et al., 2014). Tims et al. (2016) also recently conducted a cross-lagged panel research study (three wave), and found that job crafting in week one was positively related to P-J fit in the following week, suggesting that job crafting has a delayed causal effect on P-J fit over time. Moreover, a recent experimental study by Kooij and colleagues (2017) explored the effects of a job crafting intervention on P-J fit, and found that the intervention prompted older employees to engage more in strengths-based job crafting, which, in turn, improved their P-J fit. While previous claims (Berg, Dutton, & Wrzesniewski, 2013; Wrzesniewski & Dutton, 2001) and a small research body support the bivariate relation between job crafting and P-J fit, there is few studies have explored the processes through which job crafting relates to P-J fit, especially at the week level.

It is argued that basic needs satisfaction (i.e. need for autonomy, competence, and relatedness) mediates the relationship between weekly job crafting (task, relational, and cognitive crafting) and weekly P-J fit. Edwards and Shipp (2007) advocate that initiating and creating opportunities at work through proactive changes (e.g., job crafting) can satisfy basic psychological needs and result in better fit. The present study extends the proposition that job crafting is a good means to enhance P-J fit (*cf.* Tims & Bakker, 2010), by examining the underlying processes through which job crafting may affect P-J fit. Parallel to previous

research that has investigated basic needs satisfaction as a mediator (e.g., De Gieter et al., 2017; Greguras & Diefendorff, 2009), this study specifically looked at how the satisfaction of the different basic needs mediate the relationship between the different forms of job crafting and P-J fit. Although requests have been made for future researchers to consider basic needs satisfaction as a mechanism through which job crafting affects P-J fit (Tims et al., 2016), there remains a paucity of studies that tested this relationship empirically, and, as such, the proposed hypotheses could be considered somewhat exploratory.

4.2.3.1 Task crafting

Through weekly task crafting activities (i.e. weekly changes in the structure, scope, and nature of the job), individuals may create a better weekly alignment between their personal characteristics (knowledge, preferences, skills, and abilities) and the characteristics of the job (Tims & Bakker, 2010). When individuals feels that their personal characteristics are more aligned to their job, they are likely to feel more competent in performing the job. Wrzesniewski and Dutton (2001) refer to this feeling of competence as an enhanced positive self-image or improved work identity. This increased feeling of competence is then likely to make the job holder feel that he or she has what it takes to perform the task or job at hand, subsequently leading to an enhanced perception of P-J fit in terms of their personal capabilities and the requirements of the job. A study conducted at a large Midwestern university found that the effects of performance on person–role fit (similar to P-J fit) was stronger for individuals who had a high level of self-efficacy (i.e. competence), suggesting that the more competent an individual feels, the more likely he or she is to perform well and subsequently fit the role (DeRue & Morgeson, 2007). From the above, the following is hypothesised:

Hypothesis 4: (a) Weekly competence satisfaction is positively related to weekly P-J fit; (b) Weekly competence satisfaction mediates the relationship between weekly task crafting and weekly P-J fit.

Furthermore, when individuals initiate changes in their physical job boundaries through task-crafting behaviour, they do so of their own will (Wrzesniewski & Dutton, 2001); therefore, job crafting is a bottom-up approach to job design. By taking control over how the job is laid out and subsequently performed, the employee begins to feel more autonomous and self-governed, which, in turn, may provide the individual with an enhanced perception of P-J fit. Looking at

one particular item from Saks and Ashforth's (1997) P-J Fit Scale: "My job fulfils my needs," it is plausible to argue that, when individuals satisfy their weekly need for autonomy through weekly task-crafting behaviour, they may feel that their job fulfilled their weekly needs (i.e., need for autonomy), and, hence, experience improved fit. Accordingly, the following is hypothesised:

Hypothesis 5: (a) Weekly autonomy satisfaction is positively related to weekly P-J fit; (b) Weekly autonomy satisfaction mediates the relationship between weekly task crafting and weekly P-J fit.

4.2.3.2 Relational crafting

In terms of weekly relational crafting, it was previously argued that employees may satisfy their weekly need for relatedness by exercising discretion over whom they interact with at work on a weekly basis, and findings of Slemp and Vella-Brodrick (2014) were presented to support this argument. A case is now made for how weekly relational crafting may affect weekly P-J fit through the weekly satisfaction of the need for relatedness. By establishing relationships with fellow colleagues at work who may share the same interests, and by avoiding contact with particular individuals who are known to run the employee down, it is expected that the employee will create a better match or alignment between his or interpersonal preferences (i.e. desire to maintain healthy relationships) and the characteristics or the job, and, hence, experience improved P-J fit. That is, through relational crafting, individuals will ensure that they tailor their specific relational needs to enable them to do the kind of work that they want to do and to achieve desired work outcomes. Accordingly, the following is hypothesised:

Hypothesis 6: (a) *Weekly relatedness satisfaction is positively related to weekly P-J fit; (b) Weekly relatedness satisfaction mediates the relationship between weekly relational crafting and weekly P-J fit.*

4.2.3.3 Cognitive crafting

It is well known that work can be psychologically taxing, placing continuous mental stress on employees to give their undivided attention to their particular work tasks. By changing the way individuals perceive or see the job through cognitive crafting, they may improve their overall experience at work (Wrzesniewski & Dutton, 2001). Reframing the job in a more

positive light may lead individuals to feel better able or mentally equipped to perform their duties, and hence provide them with a sense of competence. When employees feels more competent as a result of altering their job cognitions, they may feel that they are better matched to the job in terms of their mental capabilities and the mental requirements or characteristics of the job. Moreover, it can be argued that, when individuals feel that there is a misfit or poor match between themselves and the job, they can simply resort to cognitive crafting to reconstruct their perceptions of P-J fit. Therefore, the following is hypothesised:

Hypothesis 7: *Weekly competence satisfaction mediates the relationship between weekly cognitive crafting and weekly P-J fit.*

4.3 METHODOLOGY

4.3.1 Research Design

A quantitative panel research design was employed in the current study, which involved acquiring information (data) from respondents on particular behaviours and attitudes on a number of separate occasions (i.e. waves) (Long, 2012; Ruspini, 2002). More specifically, a four-wave weekly diary design with a one-week time lapse between each measurement occasion was used, whereby respondents completed a questionnaire every Friday, for four weeks. Bolger, Davis, and Rafaeli (2003) emphasise the importance of considering the spacing of intervals in diary studies, as this may have an impact on the responses of respondents: spacing intervals that are too long may be at risk of biased retrospection, while those that are too short may fail to capture processes that develop over time. A one-week time lag between measurement occasions was considered optimal, as it allowed enough time for the respondents to craft their jobs, satisfy their basic psychological needs, and provide an account of their P-J fit for that particular week. Diary methods are associated with a number of benefits: (1) they allow one to investigate processes (i.e. social, psychological, and physiological) within everyday situations that illustrate how persons change over time in particular variables of interest (Bolger et al., 2003); (2) they reduce the likelihood of retrospection (Ohly, Sonnentag, Niessen, & Zapf, 2010); and (3) there is enhanced reliability and validity, due to the reduction in systematic and random sources of measurement error (Bolger et al., 2003).

4.3.2 Research Procedure

In a similar fashion to a study conducted by Demerouti, Bakker, and Gevers (2015), respondents were recruited via postgraduate (honours) students enrolled in a research methodology module who, as part of their course work, were requested to administer a weekly diary booklet to individuals who were currently employed in the South African workforce. The use of student-recruited sampling methods is associated with a number of advantages, including heterogeneity of the sample, cost reduction, student learning, and elaborate research designs (*cf.* Demerouti & Rispens, 2014). Using paper-and-pencil methods, respondents were instructed to complete one (of four) diary booklets at the end of each work week (i.e. every Friday). A weekly reminder email was sent to respondents to remind them to participate in the study. Each week, respondents were requested to complete a questionnaire that measured their weekly job crafting behaviour, weekly needs satisfaction, and their weekly P-J fit. The respondents' biographical information was only assessed in the first week of the diary study. In conjunction to having the right to withdraw from the study at any point in time, the respondents were informed that their anonymity was assured, and that their responses would remain highly confidential. Furthermore, the contact details of the researcher were provided, in the event that any uncertainties arose regarding the research process.

4.3.3 Respondents

The sample consisted of n = 144 employees employed in the South African economic sector who completed a weekly diary study (every Friday) for four consecutive weeks (occasions n = 576). The mean age and organisational tenure of the sample was 36.62 (SD = 11.71) and 5.59 (SD = 6.05) respectively. The distribution of gender was in slight favour of women (59%; n = 85). In terms of marital status, 48% (n = 69) were married, 25% (n = 36) were single/widow/widower and 23% (n = 33) were engaged/in a relationship. The majority of the sample identified themselves as black African (49%), with the remainder identifying themselves as either white (25%; n = 36) or Indian/Mixed Race (25%; n = 36). With respect to home language, 47% (n = 68) indicated that they spoke one of the indigenous African languages (e.g., IsiZulu, Sesotho, Tshivenda), 39% (n = 56) indicated that they spoke English, and 14% (n = 20) indicated that they spoke Afrikaans. The respondents rated their English reading ability as either *Good* (35%) or *Very good* (65%). Respondents' highest education level was as follows: 53% held a bachelor's degree or diploma, 22% held Matric, and 19% indicated that they held either an honours or Master's degree. The sample spanned a range of

industries, including finance (27%), education (27%), services (8%), healthcare (5%), events/hospitality (4%), and other, non-specified industries (10%).

4.3.4 Weekly Measures

4.3.4.1 Basic needs satisfaction

The Basic Needs Satisfaction at Work Scale (Deci et al., 2001) was used to assess individuals' weekly satisfaction of the three basic psychological needs. The 21-item scale measured the extent to which individuals' weekly need for autonomy, relatedness, and competence were satisfied in that particular week. The items were adjusted to reflect needs satisfaction at the week level. Examples of items are: (*Autonomy satisfaction*) "This week, I was free to express my ideas and opinions on the job"; (*Competence satisfaction*) "This week, people at work told me I am good at what I do" and (*Relatedness satisfaction*) "This week, I got along with people at work." Responses were rated on a Likert scale ranging from *1* (*Strongly disagree*) to *7* (*Strongly agree*). Greguras and Diefendorff (2009) administered the scale to a sample of 164 full-time employees, and reported the following Cronbach alpha coefficients: *Autonomy satisfaction*: α = .66, *Relatedness satisfaction*: α = .88, and *Competence satisfaction*: α = .67.

4.3.4.2 Job crafting

Weekly job crafting behaviour was assessed with Slemp and Vella-Brodrick's (2013) JCQ. The JCQ consists of 15 items that measure task, relational, and cognitive crafting, with each dimension measured by five items. Each of the items were tailored to reflect week-level variations in job crafting behaviour. Examples of items are: (*Task crafting*) "This week, I introduced new approaches to my work", (*Relational crafting*) "This week, I made an effort to get to know people at work" and (*Cognitive crafting*) "This week, I thought about the ways in which my work positively impacts my life." All the items were scored on a seven-point Likert scale that ranged from *1* (*Strongly disagree*) to *7* (*Strongly agree*). In a study amongst 253 working adults, Slemp and Vella-Brodrick (2014) reported Cronbach alpha coefficients of .87, .83, and .89 for *Task-*, *Relational*, and *Cognitive crafting* respectively.

4.3.4.3 P-J fit

Weekly P-J fit was assessed with Saks and Ashforth's (1997) Person–Job Fit Scale. The scale comprises four items that provide a *general* perception of how well-matched the individual

feels to his or her job. The four items were adapted to reflect weekly P-J fit. An example item is: "This week, the job was a good match for me." Respondents' responses were rated on a seven-point Likert scale ranging from *1* (*Strongly disagree*) to *7* (*Strongly agree*). De Beer, Rothmann Jr., and Mostert (2016), in their three-wave study, reported a mean Cronbach alpha of .84 for the scale.

4.3.5 Statistical Analyses

All statistical analyses were carried out using the *R* statistical program (Version 3.1.3) (R Core Team, 2015), which, according to Culpepper and Aguinis (2011), allows the researcher to implement statistical techniques such as multilevel modelling (MLM). MLM is built on the premise that the data has more than one level (i.e., multilevel), or what is referred to as a *nested* or *hierarchical data structure* (Hox, 2002). In the current study, the data were analysed at both the week and person level, where week-level data (Level 1: within-persons) were nested within the person (Level 2: between-persons). The data were analysed in long or univariate format containing a time (occasion) variable, which is a prerequisite for conducting MLM (Long, 2012).

Prior to conducting the mediated multilevel analyses, the intraclass correlation coefficients (ICCs) were calculated for each variable, to determine the appropriateness of using MLM. The ICC, also known as the 'cluster effect,' describes the amount of variance in the outcome variable that is accounted for between persons (Level 2 units) (Hox, 2002; Raudenbush & Bryk, 2002), and ranges from 0 to 1, with higher values indicating greater between-person variance. Long (2012) describes between-person variability as variation that is due to individual differences, whereas within-person variability is an indication of variance that is due to changes in the response variable over time. If there is sufficient between-person (Level 2) variance, the use of MLM is justifiable. An overview of the literature, however, presented no clear cut-off values for determining appropriate ICCs, but a previous review had found a median ICC of 0.12 (James, 1982).

To analyse the descriptive statistics of the scales (i.e. means, standard deviations, correlations, skewness, kurtosis, and reliabilities), the *psych* (Revelle, 2016) statistical package was used, whereas the *nlme* (Pinheiro, Bates, DebRoy, & Sarkar, 2016) and the *lme4* (Bates, Maechler, Bolker, & Walker, 2015) statistical packages were used to perform the multilevel analyses,

with maximum likelihood (ML) as the estimator. According to Long (2012, p. 192), "ML provides a method of linking the crucial ingredients necessary for sound inference: the sample data, the unknown model parameters, and the statistical assumptions (e.g., normality)." All the independent variables were group-mean centred, which provides for clearer interpretation of the variances for the random intercept and slopes (Hox, 2002). To test the research hypotheses, random intercept and random slope modelling was used (Hox, 2002), whereby a random-intercept model (Null Model) was compared to a random-intercept and slope model (Model 1) for each hypothesis.

Twisk (2006) states that, to determine the need for random slopes, the likelihood ratio test (-2LL), or what is commonly known as a *deviance test*, should be applied. The deviance test is mainly used to test the random part of the model, and provides a measure of lack of fit between model and data (Snijders & Bosker, 2004), with the model presenting the smallest deviance considered the better-fitting model and one where random slopes are justified (Hox, 2002). Model comparisons were made using the 'anova' function, which computes the analysis of variance (or deviance) for one or more fitted model objects (Chambers & Hastie, 1992). In addition, the Akaike information criterion (AIC), Bayesian information criterion (BIC), and the statistical significance for each model was inspected for model comparison purposes. The AIC and BIC are particularly useful for comparing different models against each other, with the model producing the smallest values considered the best-fitting model (Heck & Thomas, 2009; Netemeyer, Bearden, & Sharma, 2003). In terms statistical significance, models that produced *p*-values equal to or less than 0.05 were considered statistically significant (Long, 2012). Further to this, each model contained a variance component, indicating the amount of variance that was attributable to random intercepts and slopes (between-person variance) and residual variance (between-person variance). Hox (2002) argues that a simple approach to investigating the proportion of explained variance is to inspect the residual error variances across a sequence of models. Therefore, the residual variance of the intercept-only model was compared to the residual variance of the intercept and slope model, to determine whether the addition of random slopes for individuals accounted for additional unexplained (residual) variance.

Although missing data are known a common problem in longitudinal research, MLM does not require complete data, and is very flexible in accommodating missing data (Long, 2012; Twisk,

2006). Inspection of individuals' responses showed that there were no trends or patterns in missing data over the four consecutive weeks, and, as such, missing data were treated as missing at random (MAR) and subsequently retained. Lastly, MLM is regarded as a suitable procedure for large samples (*cf.* Hayes, 2006), but what constitutes a large enough sample remains unclear. However, previous simulation research has agreed on a preferred Level 2 sample size of at least 100 (Van der Leeding, Busing, & Meijer, 1997), to which the current sample size adhered, and was thus considered sufficient for conducting MLM.

4.4 RESULTS

4.4.1 Descriptive Statistics

Table 21, below, provides the means, standard deviations, reliabilities, and correlations between the observed study variables, where the four measurements for each respondent are averaged across the weekly occasions. The reliabilities ranged from .48 (*Autonomy satisfaction*) to .90 (*P-J fit*). All three forms of job crafting behaviour were positively related to the satisfaction of all three basic psychological needs. Furthermore, the satisfaction of each basic psychological need and all three forms of job crafting were positively related to P-J fit.

Table 21

Means, Standard Deviations, Reliabilities (in the diagonal) and Correlations between the Variables; n = 144

	M	*SD*	1	2	3	4	5	6	7
1. Task crafting	4.55	1.20	.78						
2. Cognitive crafting	5.13	1.24	.46**	.86					
3. Relational crafting	3.60	1.32	.47**	.40**	.75				
4. Competence satisfaction	4.82	1.00	.41**	.37**	.25**	.63			
5. Autonomy satisfaction	4.51	0.85	.36**	.34**	.27**	.61**	.48		
6. Relatedness satisfaction	4.88	0.95	.27**	.34**	.25**	.52**	.60**	.75	
7. P-J fit	5.23	1.40	.42**	.51**	.36**	.47**	.41**	.35**	.90

Note. Prior to computing correlations, all weekly variables were aggregated across each respondent (i.e. they were averaged over the four weeks); **$p < .01$ (two-tailed)

4.4.2 Multilevel Analysis

4.4.2.1 Determining the intraclass correlation coefficients (ICCs)

An intercept-only model was created for each study variable, to determine the ICC or the variance that was accounted for between individuals. For weekly *P-J fit*, the between-person variance was 15.77, and the within-person variance was 13.33, yielding an ICC value of 0.54, suggesting that 54% of the variance in weekly *P-J fit* was explained by between-person differences. With respect to the three job crafting dimensions, the between-person variance for *Task crafting* was 13.59, and the within-person variance was 22.60, yielding an ICC value of 0.38, meaning that 38% of the variance in weekly task crafting behaviour was explained by differences between the individuals.

For *Cognitive crafting*, the between-person variance was 19.60, while the within-person variance was 18.54, yielding an ICC value of 0.51, suggesting that 51% of the variance in *Cognitive crafting* was explained by between-person differences. For *Relational crafting*, the between-person variance was 18.61, and the within-person variance was 24.94, yielding an ICC value of 0.43, indicating that 43% of the variance in weekly relational crafting behaviour was explained by differences between individuals. In terms of the three basic psychological needs, *Competence satisfaction* returned a between-person and within-person variance of 11.31 and 24.21 respectively, yielding an ICC value of 0.32. That is, 32% of the variance in *Competence satisfaction* was accounted for by between-person differences. Looking at *Autonomy satisfaction*, the between-person and within-person variances were 13.35 and 21.66 respectively, yielding an ICC value of 0.38. Thus, 38% of the variance in *Autonomy satisfaction* was explained by between-person differences. Finally, *Relatedness satisfaction* yielded a between-person variance of 26.85 and a within-person variance of 31.11, yielding an ICC value of 0.46 and suggesting that 46% of the variance in *Relatedness satisfaction* was explained by differences between individuals. In sum, the ICC values ranged from .32 to .54 across the study variables, providing sufficient grounds to pursue multilevel analyses.

Need Satisfaction Mediates the Relationship between Job Crafting and P-J Fit

4.4.2.2 Pre-step: Weekly job crafting (IV) predicts Weekly P-J fit (DV)

The procedure outlined by Kenny et al. (2003) for investigating multilevel mediation was followed to test whether needs satisfaction (i.e. *Competence*, *Autonomy*, and *Relatedness*)

mediated the hypothesised relationships between the different forms of job crafting and P-J fit. A pre-step was conducted that involved specifying the direct paths between the independent variables (*Task-*, *Relational*, and *Cognitive crafting*) and the dependent variable (*P-J fit*), without the inclusion of any mediating variables. A random-intercept model (Null Model), which allowed the intercept of the outcome variable to vary across persons, was compared to a random-intercept and slope model (Model 1), where the slope of the explanatory variable was also allowed to vary across persons. This procedure of comparing models with random-intercepts (Null Model) versus random-intercept and slopes (Model 1) was followed in each step of the analysis.

Although no formal hypotheses were specified with regard to the direct job crafting–P-J fit relationship, since this study largely focused on the mediational process through which this relationship unfolds, results of the pre-step analysis showed that weekly *Task crafting* ($\gamma = 0.14$; $p < 0.001$), *Relational crafting* ($\gamma = 0.08$; $p < 0.05$), and *Cognitive crafting* ($\gamma = 0.28$; $p < 0.001$) were all positively related to weekly *P-J fit* (see Table 22). The change in log-likelihood (Δ - 2 log = 62.43; $p < .001$) was statistically significant, and indicated an improvement in the model that included *Job crafting* dimensions over the intercept-only model (Null Model). This was further confirmed with the smaller AIC and BIC values of the intercept and slope model (Model 1). In addition, the variance in random intercepts, as well as the residual variance, decreased as a result of including random slopes (i.e. differences in *Task-*, *Relational*, and *Cognitive crafting*), suggesting that a proportion of individuals' weekly P-J fit can be explained by their weekly job-crafting activities. In sum, including random slopes for *Task-*, *Relational*, and *Cognitive crafting* reduced the unexplained (residual) variance.

Table 22

Weekly Job Crafting Predicts Weekly P-J Fit

	Null Model (Intercept only)		Model 1 (Intercept and slope)	
Variable	Estimate	*SE*	Estimate	*SE*
Intercept (P-J fit)	20.91	0.29	20.88	0.27
Task crafting			0.14**	0.04
Relational crafting			0.08*	0.03
Cognitive crafting			0.28**	0.04
-2 x log		3229.96		3167.53
Δ - 2 log				62.43**
Df		7		16
AIC		3243.96		3199.53
BIC		3274.45		3269.22
Variance				
Between-person				
Random intercept variance	9.11		8.21	
Random slope variance			0.19	
Within-person				
Residual variance	11.09		6.24	

Note. **$p < .001$, *$p < .05$

4.4.2.3 Step 1: Weekly Job Crafting (IV) predicts Weekly Needs Satisfaction (M)

Table 24, below, shows the differential effects of the three job crafting behaviours (*Task crafting, Relational crafting, Cognitive crafting*) on the satisfaction of the three different basic psychological needs (*Competence satisfaction*, *Autonomy satisfaction*, and *Relatedness satisfaction*) in three consecutive models. Hypothesis 1a and Hypothesis 3 stated that there is a positive relationship between weekly task crafting and weekly competence satisfaction, and between weekly cognitive crafting and weekly competence satisfaction. Weekly *Task crafting* ($\gamma = 0.26$; $p < 0.001$) and weekly *Cognitive crafting* ($\gamma = 0.20$; $p < 0.001$) were indeed found to be positively related to weekly *Competence satisfaction*, with weekly *Competence satisfaction* increasing by .26 and .20 units as a result of weekly *Task crafting* and *Cognitive crafting* activities respectively. A comparison of the two models (i.e. Null Model and Model 1) showed that including *Task crafting* and *Cognitive crafting* as predictors of weekly *Competence satisfaction* provided better fit over the intercept-only model (Δ - 2log = 25.50; $p < .001$). Although the BIC values were somewhat larger for Model 1, the AIC values were smaller and

the -2LL was statistically significant, suggesting that Model 1 was still the best-fitting model. Hypothesis 1a and Hypothesis 3 are thus largely confirmed.

Weekly task crafting was also proposed to be positively related to weekly autonomy satisfaction (Hypothesis 1b). Weekly *Task crafting* ($\gamma = 0.30$; $p < 0.001$) was indeed found to be positively related to weekly *Autonomy satisfaction*, with weekly *Task crafting* leading to a .30 unit increase in weekly *Autonomy satisfaction*. A comparison of the two models (i.e. Null Model and Model 1) showed that including *Task crafting* as a predictor of weekly *Autonomy satisfaction* yielded better fit over the intercept-only model (Δ - 2 log = 45.53; $p < .001$). Furthermore, the AIC and BIC values for Model 1 were smaller in comparison to the Null Model, suggesting a better-fitting model. The results thus provide support for Hypothesis 1b.

Hypothesis 2 proposed that a positive relationship exists between weekly relational crafting and weekly relatedness satisfaction. Results showed that weekly *Relational crafting* ($\gamma = 0.27$; $p < 0.001$) was indeed positively related to weekly *Relatedness satisfaction*, with weekly *Relational crafting* activities resulting in a .27 unit increase in *Relatedness satisfaction*. A comparison of the two models (i.e. Null Model and Model 1) showed that including *Relational crafting* as a predictor of weekly *Relatedness satisfaction* yielded better fit over the intercept-only model (Δ - 2 log = 45.53; $p < .001$). Furthermore, the AIC and BIC values for Model 1 were smaller in comparison to the Null Model, suggesting a better-fitting model. Based on the above, Hypothesis 2 is accepted.

Table 23 further provides the variance components for the Null Model (intercept-only) and Model 1 (random intercept and slopes). It can be seen that the addition of random slopes for each relationship tested (i.e., 1. *Task crafting + Cognitive crafting → Competence Satisfaction*; 2. *Task crafting → Autonomy satisfaction*; 3. *Relational crafting → Relatedness satisfaction*) resulted in a substantial decrease in the unexplained/residual variance (i.e. within-person variance). The reduction in unexplained (Level 1) variance suggests that individuals' weekly needs satisfaction can be, in part, explained by differences in the job-crafting behaviours they engaged in in that particular week.

Table 23

Weekly Job Crafting Predicts Weekly Need Satisfaction

	Null Model (Intercept only)		Model 1 (Intercept and slope)	
Variable	Estimate	*SE*	Estimate	*SE*
1. TC + CC → CNS				
Intercept	28.88	0.31	28.92	0.29
Task crafting			0.26**	0.05
Cognitive crafting			0.20**	0.05
-2 x log		3508.711		3483.22
Δ - 2 log				25.50**
df		6		11
AIC		3520.71		3505.22
BIC		3546.85		3553.14
Variance				
Between-person				
Random intercept variance	7.36		7.58	
Random slope variance			0.13	
Within-person				
Residual variance	20.76		16.22	
2. TC → ANS				
Intercept	31.60	0.33	31.66	0.34
Task crafting			0.30**	0.05
-2 x log		3512.29		3466.76
Δ - 2 log				45.53**
df		5		7
AIC		3522.29		3480.76
BIC		3544.065		3511.25
Variance				
Between-person				
Random intercept variance	11.18		11.19	
Random slope variance			0.15	
Within-person				
Residual variance	19.30		14.87	

3. RC → RNS				
Intercept	38.99	0.48	39.22	0.49
Relational crafting			0.27**	0.06
-2 x log		3792.67		3735.81
Δ - 2 log				56.86**
df		5		7
AIC		3802.67		3749.81
BIC		3824.45		3780.30
Variance				
Between-person				
Random intercept variance	25.32		26.00	
Random slope variance			0.23	
Within-person				
Residual variance	29.13		21.18	

Note. TC = Task crafting; CC = Cognitive crafting; RC = Relational crafting; CNS = Competence need satisfaction; ANS = Autonomy need satisfaction; RNS = Relatedness need satisfaction; *p < .001

4.4.2.4 Step 2: Weekly Need Satisfaction (M) Predicts Weekly P-J Fit (DV)

The next step of the analysis involved investigating the paths between the mediating variables (*Competence satisfaction*, *Autonomy satisfaction*, *Relatedness satisfaction*) and the criterion variable (*P-J fit*). Table 24 shows the differential effects of each need satisfaction on *P-J fit*. Inspection of model fit statistics showed that Model 1 (intercept-and-slope model) was superior in fit compared to the intercept-only model (Null Model). Specifically, the inclusion of each need satisfaction variable significantly improved the fit of the model (Δ - 2 log = 42.71; p < .001), and the AIC and BIC values also reduced as a result of including random slopes. Weekly *Competence satisfaction* (γ = 0.15; p < 0.001) and weekly *Autonomy satisfaction* (γ = 0.21; p < 0.001) were both positively related to week-levels of P-*J fit*, providing support for Hypotheses 4a and 5a. However, weekly *Relatedness satisfaction* was unrelated to weekly *P-J fit* (γ = 0.05), leading to the rejection of Hypothesis 6a.

Table 24 further provides the variance components of the models. As can be seen, the addition of random slopes (Model 1) decreased the unexplained (residual) variance. This suggests that individuals' level of weekly P-J fit can, in part, be explained by differences in their weekly needs satisfactions. That is, the addition of satisfaction of the three needs as a predictor of weekly *P-J fit* explained more between-person (level 2) variance when compared to the Null model.

Table 24
Weekly Need Satisfaction and weekly P-J Fit

	Null Model (Intercept only)		Model 1 (Intercept and slope)	
Variable	Estimate	*SE*	Estimate	*SE*
Intercept	20.91	0.32	21.08	0.30
Competence satisfaction			0.15**	0.05
Autonomy satisfaction			0.21**	0.05
Relatedness satisfaction			0.05	0.04
-2 x log		3233.44		3190.74
Δ - 2 log				42.71**
Df		7		16
AIC		3247.44		3222.74
BIC		3277.93		3292.43
Variance				
Between-person				
Random intercept variance	11.85		11.39	
Random slope variance			0.23	
Within-person				
Residual variance	10.47		5.75	

Note. *$p < .001$

4.4.2.5 The Indirect Effects of Job Crafting on P–J Fit through Needs Satisfaction

The final step of the mediational analysis was to investigate the indirect effects of the independent variables on the dependent variable through their respective mediating variables, of which the results are reported in Tables 25 and 26, below. Table 25 shows the mediating effect of weekly *Task*- and *Cognitive crafting* on weekly *P-J fit* through weekly *Competence satisfaction*. Inspection of model fit statistics showed that the inclusion of both predictor variables (weekly *Task*- and *Cognitive crafting*) as well as the mediating variable (weekly *Competence satisfaction*) yielded a better fit over the intercept-only model (Δ - 2 log = 51.27; $p < .001$). Results showed that weekly *Task crafting* ($\gamma = 0.11$; $p < 0.001$), weekly *Cognitive crafting* ($\gamma = 0.26$; $p < 0.001$), and weekly *Competence satisfaction* ($\gamma = 0.19$; $p < 0.001$) significantly predicted weekly *P-J fit*. Furthermore, when comparing the intercept-only (Null) model to the intercept-and-slope model (Model 1), it can be seen that the addition of random slopes decreased the unexplained (residual) variance, which suggests that variation in individuals' weekly P-J fit can be attributed to differences in their weekly task- and cognitive

crafting activities, as well as to the extent to which their need for competence was satisfied in that particular week. Given the statistically significant relationship between weekly *Task crafting* and weekly *Cognitive crafting* with weekly *P-J fit* respectively, the relationships between (a) weekly task crafting and P-J fit, and (b) weekly cognitive crafting and P-J fit are partially mediated by competence need satisfaction. The results provide support for Hypothesis 4b and Hypothesis 7. Figure 29 presents a diagrammatical representation of the indirect effects.

Table 25

The Indirect Effects of (a) Weekly Task Crafting and (b) Weekly Cognitive Crafting on Weekly P-J Fit through Weekly Competence Need Satisfaction

	Null Model (Intercept only)		Model 1 (Intercept and slope)	
Variable	Estimate	*SE*	Estimate	*SE*
Intercept	20.91	0.28	20.95	0.26
Task crafting			0.11**	0.04
Cognitive crafting			0.26**	0.04
Competence need satisfaction			0.19**	0.04
-2 x log		3191.23		3139.96
Δ - 2 log				51.27**
Df		7		16
AIC		3205.28		3171.96
BIC		3235.72		3241.65
Variance				
Between-person				
Random intercept variance	8.23		8.29	
Random slope variance			0.14	
Within-person				
Residual variance	10.45		6.03	

Note. ** $p < .001$

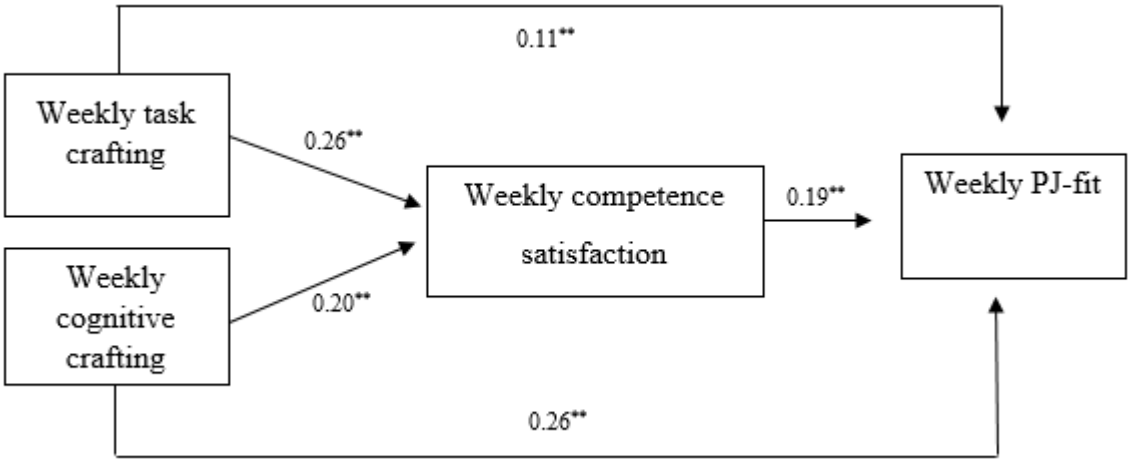

Figure 29. Weekly competence satisfaction mediating the relationships between (a) *weekly Task crafting* and *weekly P-J fit*, and (b) *weekly Cognitive crafting* and *weekly P-J fit*.

Hypothesis 5b stated that satisfaction of the weekly need for autonomy mediates the relationship between weekly task crafting and weekly P-J fit. Table 26 presents the results pertaining to this hypothesis. Comparing the intercept-only model (Null Model) to the intercept-and-slope model (Model 1), the fit statistics point to Model 1 being better-fitting model. Specifically, the inclusion of weekly *Task crafting* and weekly *Autonomy satisfaction* yielded a statistically significant model and better fit over the intercept-only model (Δ - 2 log = 28.52; $p < .001$). Furthermore, the inclusion of random slopes in Model 1 decreased the unexplained (residual) variance, suggesting that individual variations in weekly P-J fit can be attributed to differences in individuals' weekly task-crafting activities and the extent to which their need for autonomy was satisfied. Table 26 shows that weekly *Task crafting* ($\gamma = 0.17$; $p < 0.001$) and weekly *Autonomy satisfaction* ($\gamma = 0.23$; $p < 0.001$) were found to be statistically significant predictors of weekly *P-J fit*. Given that the direct path between weekly *Task crafting* and weekly *P-J fit* was statistically significant, weekly *Autonomy satisfaction* partially mediated the relationship, Hypothesis 5b is accepted. Figure 30 presents a diagrammatical representation of the indirect effect.

Table 26

The Indirect Effect of Weekly Task Crafting on Weekly P-J Fit through Weekly Autonomy Satisfaction

	Null Model (Intercept only)		Model 1 (Intercept and slope)	
Variable	Estimate	*SE*	Estimate	*SE*
Intercept	20.91	0.32	21.02	0.30
Task crafting			0.17**	0.04
Autonomy need satisfaction			0.23**	0.04
-2 x log		3234.50		3205.98
Δ - 2 log				28.52**
df		6		11
AIC		3246.50		3227.98
BIC		3272.63		3275.90
Variance				
Between-person				
Random intercept variance	11.59		9.85	
Random slope variance			0.11	
Within-person				
Residual variance	10.55		8.14	

Note. ** $p < .001$

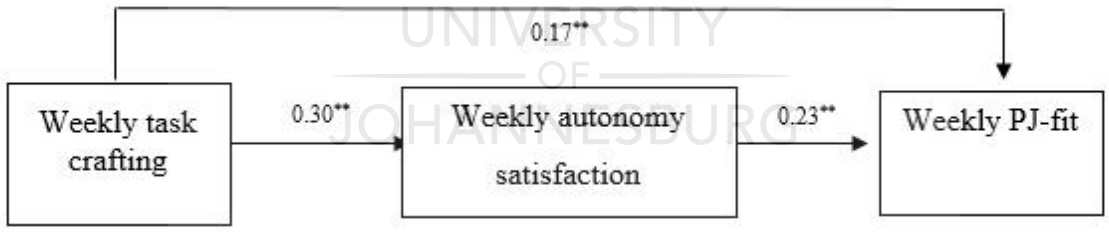

Figure 30. Weekly autonomy satisfaction mediating the relationships between weekly Task crafting and weekly P-J fit

Hypothesis 6 stated that satisfaction of the weekly need for relatedness mediates the relationship between weekly relational crafting and weekly P-J fit. Due to *Relatedness satisfaction* (mediator) having a non-statistically significant relationship with weekly *P-J fit*, mediation could not be tested, and, as a result, Hypothesis 6 is rejected.

4.5 DISCUSSION

Drawing inspiration from SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) and Wrzesniewski and Dutton's (2001) original Job Crafting Model, the aim of the present weekly diary study was to investigate whether employees can use weekly job-crafting behaviour to satisfy their basic weekly need for autonomy, competence, and relatedness, and in turn, improve their weekly P-J fit. While previous research has found job crafting to be positively associated with P-J fit (Chen et al., 2014; Kooij et al., 2017; Lu et al., 2014; Tims et al., 2016), less research has been conducted on the underlying mechanisms through which job crafting affects P-J fit. Accordingly, the present research embarked on an investigation to determine whether basic needs satisfaction mediates the relationship between job crafting and P-J fit. The results of the study largely support the idea that job crafting leads to increases in P-J fit through the satisfaction of basic psychological needs. A discussion of the most important findings and contributions of the study is provided below.

4.5.1 Job Crafting Leads to the Satisfaction of Basic Psychological Needs

The extent to which individuals are motivated and display wellbeing at work rests largely on the satisfaction of their basic psychological needs for autonomy, competence, and relatedness (Deci et al., 2001; Slemp & Vella-Brodrick, 2014), and, as such, it is imperative that organisations understand the behavioural mechanisms that lead to the satisfaction of these three innate and universal needs. Wrzesniewski and Dutton (2001) proposed that individuals are motivated to craft their jobs to satisfy their need for control (i.e. autonomy), a positive self-image (i.e. competence), and for human connection with others (i.e. relatedness), and other researchers attest that employees can use job crafting as a means to satisfy these basic needs (Bakker & Van Woerkom, 2017; Lyons, 2008; Tims et al., 2016). However, empirical evidence supporting these claims is lacking.

Results derived from the current study's analyses indeed found that employees can use job-crafting behaviour to satisfy their basic psychological needs on a weekly basis, thus lending empirical support to previous theoretical claims regarding the job crafting–need satisfaction relationship (e.g., Bakker & Van Woerkom, 2017; Tims et al., 2016). Corroborating previous correlational findings of Slemp and Vella-Brodrick (2014), although at the week level, the present study found that employees who engage in weekly task crafting experience increases

in their weekly competence and autonomy need satisfaction respectively, suggesting that, by shaping their physical task boundaries and exercising discretion over how job tasks are executed, employees are able to experience an increased sense of mastery (i.e. competence) and control (i.e. autonomy) over their work environment on a weekly basis. Drawing on SDT (Ryan & Deci, 1985, 2000), task crafting can thus enable individuals to attain desired work outcomes, succeed at optimally challenging tasks, and feel like the initiator of their own actions (Deci, 1975; Deci et al., 2001; White, 1959). A previous diary study conducted by Sheldon, Ryan, and Reis (1996) found that employees tended to experience daily wellbeing or 'better' days, on average, when their needs for autonomy and competence are satisfied, and, thus, it is plausible to argue that employees can also enhance their daily and/or weekly wellbeing by satisfying their needs for autonomy and competence through weekly task-crafting activities. In fact, it is well documented in the literature that job crafting is related to employee wellbeing (e.g., Bakker, Rodriguez-Muñoz, & Sanz Vergel, 2015; Rudolph, Katz, Lavinge, & Zacher, 2017; Slemp & Vella-Brodrick, 2014).

As anticipated, weekly relational crafting was found to predict an increase in weekly relatedness satisfaction, suggesting that employees who exercised discretion over whom they interacted with at work on a weekly basis are able to satisfy their weekly relational needs. This finding supports Wrzesniewski and Dutton's (2001) claim that employees craft their relational boundaries to fulfil their basic need for human connection with others, and confirms the finding of Slemp and Vella-Brodrick (2014) of a positive relationship between relational crafting and satisfaction of the need for relatedness. Baumeister and Leary (1995) state that, for an individuals' relatedness need or need for belongingness to be satisfied, it is required that they feel cared for, respected, and relied upon by others. Thus, taking the above findings of the present study into account, relational crafting can be seen as an effective strategy that can help employees achieve feelings of care, respect, and reliance, and subsequently satisfy their need for relatedness.

The last finding regarding the job crafting–needs satisfaction relationship pertains to cognitive crafting behaviour. The study hypothesised and confirmed that employees who engage in weekly cognitive crafting experience increased weekly competence satisfaction, a finding that is again consistent with that of Slemp and Vella-Brodrick (2014). That is, through reconstructing their perceptions of their job on a weekly basis, employees are able to feel more competent and capable in performing their weekly job tasks, offering support to previous

claims made that employees can use job crafting (e.g., cognitive crafting) tactics to feel more competent and effective in performing their jobs (Tims et al., 2014) and to develop a more favourable (positive) self-image (Wrzesniewski & Dutton, 2001). Results from a previous study conducted in two work settings found that, of the three basic psychological needs, competence satisfaction is most strongly (and negatively) related to anxiety/depression (Baard, Deci, & Ryan, 2004). Taking this finding into account, it can be inferred that individuals employ cognitive crafting as a means to satisfy their need for competence, which in turn, may help them combat the effects of anxiety and depression that they may experience in the workplace. It is not surprising then that need satisfaction (e.g., competence satisfaction) is linked to psychological growth and adjustment (Deci & Ryan, 1985; Ryan & Deci, 2000; Van den Broeck, Ferris, Chang, & Rosen, 2016), which this study argues can be attained through cognitive forms of job-crafting behaviour.

4.5.2 Job Crafting Leads to Improvements in P–J fit through Basic Needs Satisfaction

Research concerning the relationship between job crafting and P-J fit is still largely in its infancy. A few promising lines of evidence do, however, suggest that there is a positive association between these two constructs (Chen et al., 2014; Kooij et al., 2017; Lu et al., 2014; Tims et al., 2016). According to Kooij et al. (2017), there is a strong need to understand *how* employees can facilitate higher levels of P-J fit, and thus, a secondary aim of the current research was to explore basic needs satisfaction as a mechanism through which job crafting affects P-J fit, or, more formally stated, to explore whether needs satisfaction mediates the relationship between job crafting and P-J fit.

Results from the multilevel mediation analyses indeed found support for basic needs satisfaction as a mediator of the relationship between job crafting and P-J fit. In particular, weekly competence need satisfaction mediated the relationships between (a) weekly task crafting and weekly P-J fit, and (b) between weekly cognitive crafting and weekly P-J fit. With regard to the former, employees who engaged in weekly task-crafting behaviour reported increases in their weekly competence satisfaction, which, in turn, was predictive of increases in their weekly perceptions of P-J fit. This findings implies that crafting task boundaries enables employees to feel more competent and capable in performing their job roles (Tims et al., 2014), which, in turn, provides the employee with a greater perception of fit between their personal characteristics and the characteristics of the job. The positive relationship between

task crafting and P-J fit has also been confirmed in previous longitudinal research. Lu et al. (2014), for example, found that physical job crafting (i.e. task crafting) was positively related to D-A fit amongst a sample of Chinese employees; however, the current study extends Lu et al.'s (2014) research by demonstrating the indirect way in which task crafting can affect P-J fit, namely through competence need satisfaction.

With regard to the competence need satisfaction, respondents who engaged in weekly cognitive crafting behaviour reported increases in their weekly competence satisfaction, which, in turn, was predictive of increases in their weekly perceptions of P-J fit. Thus, when employees reframe their weekly perceptions of the job (i.e. seeing their job as a meaningful contribution to their company and personal lives), they not only feel more self-efficacious and an increased sense of mastery over their work environment (i.e. competence) (White, 1959), they also feel an improved sense of fit between themselves and the job in that week. Employees can thus create a better alignment between themselves and their job by simply changing the way they see their job, providing support for argument by Wrzesniewski et al. (2013) that job crafting is primarily aimed at improving P-J fit. Previous research on the relationship between job crafting and P-J fit did not considered the unique effect of cognitive crafting on P-J fit, and, thus, no direct comparisons of the current finding can be made to extant research.

Results further confirmed that weekly autonomy need satisfaction mediates the relationship between weekly task crafting and weekly P-J fit. That is, employees who alter the form or number of activities they engaged in on a weekly basis (i.e. task crafting) (Wrzesniewski & Dutton, 2001), feel more in control and self-determined (i.e. autonomous), and subsequently experience improved fit to the job in the same week. This finding gives credit to Bakker and Van Woerkom's (2017) conceptualisation of job crafting as a self-determining strategy that employees can use to satisfy their basic needs. Furthermore, Wrzesniewski and Dutton (2001) advocate that, regardless of how routine or restricted employees' jobs are, they still have the latitude to define and enact the job. What this finding suggests is that, despite the contextual factors/conditions governing the work and jobs of employees, they may still resort to job crafting (i.e. task crafting) as a means to feel more self-governed, liberated, and in control of their jobs, which may be particularly useful for employees who find their jobs to be highly monotonous and boring. Indeed, previous research has demonstrated that job-crafting behaviour can help employees deal with the effects of job boredom (see Harju et al., 2016).

Lastly, and contrary to the present researcher's expectations, no support was found for a mediating effect between relational crafting and P-J fit through relatedness satisfaction. In the multilevel analysis, *Relatedness satisfaction* was found to positively relate to *P-J fit* only when analysed as a separate construct; however, when *Competence-* and *Autonomy satisfaction* were added to the equation, *Relatedness satisfaction* was not a statistically significant predictor of *P-J fit*. Perhaps when controlling for all three basic needs, autonomy and competence satisfaction are more important for P-J fit than relatedness satisfaction is. It may be that individuals experience improved fit to the job when they feel a sense of control and mastery over their job, more than when their relational needs are met. Relationships do play an important role in how employees experience their work, but technical skills (i.e. competence) and work control (i.e. autonomy) may be more important for successful job performance.

4.5.3 Practical Implications and Contributions of the Study

The satisfaction of basic psychological needs has important implications for employee wellbeing and performance (Baard et al., 2004; De Gieter et al., 2017; Deci et al., 2001; Gagné & Vansteenkiste, 2013; Reis et al., 2000; Ryan & Deci, 2000; Slemp & Vella-Brodrick, 2014), yet their behavioural antecedents within work settings have remained unexplored (Slemp & Vella-Brodrick, 2014). Results from the current investigation suggest that organisations and managers should allow employees to be actively involved in the job design process through job-crafting behaviour, as it may serve as an effective means through which employees can improve their wellbeing and satisfy their basic psychological needs for autonomy, competence, and relatedness, which are considered "determinative to optimal experience and well-being in daily life" (Ryan & Deci, 2000, p. 76). The present study also demonstrated that job crafting is both directly and indirect related to P-J fit, thus presenting organisations with a promising strategy that employees can leverage and capitalise on to create and foster a better work experience by means of increased fit to the job. This finding has implications for recruitment and selection practices. Instead of organisations striving to find the right person to fit the job, they should take into account the fact that employees themselves can work on the fit between themselves and the job, through job-crafting practices.

This paper contributes to the literature in a number of ways. Firstly, the empirical findings reported here shed new light on the uncharted relationship between job crafting and basic needs satisfaction. Job-crafting proponents have speculated and argued that employees can use job

crafting to satisfy their basic needs (e.g., Bakker & Van Woerkom, 2017; Tims, Derks, & Bakker, 2016; Wrzesniewski & Dutton, 2001), yet scant empirical research exists to support their claims, and, thus, this study makes a contribution to filling this gap in the literature by furthering and deepening our understanding of the positive effects that job crafting could have in basic needs satisfaction. In support of Lyons's (2008) contentions, this study indeed showed that employees craft their work to satisfy their own personal needs, and, to the present researcher's knowledge, this is the very first study to explore the relationship between job crafting and needs satisfaction using a longitudinal (i.e. weekly) research design, which is a contribution on its own. In fact, Slemp and Vella-Brodrick (2014), who conducted a cross-sectional study amongst a sample of Australian employees on the relationship between job crafting and needs satisfaction, requested researchers to use longitudinal designs to test the effects of job crafting on needs satisfaction over time. Moreover, they stated in the discussion of the limitations of their study that it remains unknown whether job crafting affects needs satisfaction in other cultures, where group and organisational dynamics may differ. The present study demonstrated that this relationship holds true for South African employees.

A second contribution of this study is that the three basic needs were measured and subsequently analysed. In contrast to previous research (e.g., Slemp & Vella-Brodrick, 2014), the current study considered the unique and separate effects of each basic need in its relationship with job crafting and P-J fit, answering calls to stop aggregating the basic needs or focusing on an overall score for needs satisfaction (De Gieter et al., 2017; Van den Broeck et al., 2016). Therefore, the study uncovered the uniqueness behind the satisfaction of each need and its implications for job crafting and P-J fit.

The next contribution concerns the relationship between job crafting and P-J fit. Notwithstanding the fact that there are only a few studies that investigated the antecedents to P-J fit (*cf.* Kooij et al., 2017), more importantly, there is a dearth of research that looked at the effects of job crafting on P-J fit (*cf.* Tims et al., 2016). It appears that, together with the studies of Tims et al. (2016) and Lu et al. (2014), this is one of very few studies that have tested the longitudinal relationship between job crafting and P-J fit, thereby not only contributing to the job-crafting literature by capturing the dynamic (week-level) nature of job crafting, but also contributing more broadly to the small knowledge base of the effects of job crafting on P-J fit, and, more specifically, to the indirect ways in which job crafting can improve P-J fit, namely through basic needs satisfaction. The study also extended job-crafting theory by uncovering

the underlying mechanisms (i.e. need satisfaction) through which job crafting affects P-J fit, and answered calls to further our understanding of *how* employees themselves can facilitate higher levels of fit (Kooij et al., 2017). More precisely, it met requests made to consider basic needs satisfaction as a mechanism through which job crafting affects P-J fit (Tims et al., 2016), and demonstrated that, apart from being a robust predictor of well-being, needs satisfaction is also important for P-J fit.

The final contribution is the manner in which job crafting was conceptualised and subsequently tested. Contrary to previous research (Chen et al., 2014; Kooij et al., 2017; Lu et al., 2014; Tims et al., 2016), this is the first study to explore the relationship between job crafting and P-J fit using the original three-component conceptualisation of job crafting proposed by Wrzesniewski and Dutton (2001), making this study unique. In particular, the study contributes to job-crafting literature by showing how the different *original* job-crafting behaviours (i.e. task crafting, cognitive crafting, and relational crafting) relate to P-J fit. and the study also answered calls to test the unique effects of both the relational and cognitive components of job crafting on P-J fit (Kooij et al., 2017). In sum, the findings provide new and interesting insights into the job crafting–P-J fit relationship using Wrzesniewski and Dutton's (2001) definition of job-crafting behaviour.

4.5.4 Limitations and Recommendations for Future Research

The study is not without any limitations. First, the sample was taken from the South African population, which is known as one of the most ethnically diverse cultures in the world. While the findings provided preliminary support for cross-cultural validity, given that the same findings were produced in a study amongst a sample of Australian employees (Slemp & Vella-Brodrick, 2014), caution should still be taken when attempting to generalise the findings across other cultures. Future researchers should build upon and extend the current findings by determining whether the same relationships do indeed exist in other populations of interest. However, inconsistencies in future research findings are not foreseen, as the three basic psychological needs are considered universal (Deci & Ryan, 1985; Ryan & Deci, 2000).

The next limitation relates to the simplistic nature of the multilevel models tested. The study used simple multilevel mediation, and did not include the effects of possible intervening (moderating) variables that may have strengthened or weakened the relationships, or explained additional variance in the constructs of interest. While this may indeed be true, there is not

much known about the 'simple' relationships between job crafting, need satisfaction, and P-J fit. Supporting this argument, Tims et al. (2016) stated that the relationship between job crafting and P-J fit has not received much research attention, while Slemp and Vella-Brodrick (2014) proclaimed that there are very few studies that explored the behavioural antecedents (e.g., job crafting) of needs satisfaction, particularly within work settings. Therefore, this study serves as a starting point or foundation for future research to expand upon and further our understanding of the relationships between job crafting, needs satisfaction, and P-J fit. One of the propositions made by SDT is that social contexts may influence individuals' needs satisfaction (Deci & Ryan, 1985; Ryan & Deci, 2000). Thus, future researchers may want to build and test more complex models in which due consideration is given to the presence of certain social/contextual factors that may influence (i.e. strengthen or weaken) the relationships between the study variables. As was demonstrated in a study amongst a sample of employees from a major banking firm, 'perceived autonomy support' (i.e. contextual factor) explained a significant amount of variance in individuals' autonomy need satisfaction (Baard et al., 2004).

The third limitation concerns the measurement and inferences regarding P-J fit. The current investigation used a global measure of fit (Saks & Ashforth, 1997), and did not focus on the two dimensions of fit that are typically explored in P-J fit research, namely D-A fit and N-S fit. The overarching objective of the present research was to determine whether an indirect relationship indeed exists between job crafting and P-J fit through basic needs satisfaction as a mediator, and not to delve into the intricacies (i.e. types) of fit. While the findings point to job crafting as an effective means to improve the *general* fit between the individuals and the job through basic needs satisfaction, future researchers may want to consider the unique effects that job crafting has on D-A fit and N-S fit through each basic psychological need.

The final limitation has to do with the low reliability reported for the *Autonomy satisfaction* subscale (α = .48). Across all four weeks, the reliability of the subscale was well below Nunnally and Bernstein's (1994) recommendation of 0.70 for good scale reliability. A post-hoc exploratory factor analysis (EFA) of the *Autonomy satisfaction* subscale showed that only two of the seven items belonging to the dimension yielded factor loadings greater than 0.30, suggesting that the scale items were not reliable measures of the construct. The *Autonomy satisfaction* scale consisted of reverse-scored items, which may be one possible reason for the low reliability, since negatively worded items may cause confusion (Taylor, 2004). Taken together, while autonomy need satisfaction was a statistically significant predictor of job

crafting and P-J fit, caution should be exercised when interpreting the findings pertaining to autonomy need satisfaction. It is recommended that a thorough investigation of the psychometric properties of the Basic Need Satisfaction at Work Scale (Deci et al., 2001) be conducted in the South African context, using different validation techniques (e.g., Rasch and multilevel confirmatory factor analysis (MCFA)).

4.5.5 Conclusion

The current weekly diary study demonstrated the utility of weekly job-crafting behaviour in affecting positive employee outcomes. Specifically, results of multilevel mediation showed that employees can use weekly job-crafting behaviour to satisfy their basic psychological needs and improve their levels of P-J fit.

CHAPTER 5:

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

In this chapter, the findings reported in Article 1 (Chapter 2), Article 2 (Chapter 3), and Article 3 (Chapter 4) are integrated and discussed. A brief background of each study, the respective objectives, and unique contributions is provided. The chapter concludes with the practical implications and limitations of each study, followed by recommendations for future research.

5.1.1 Aims and Objectives of Each Study

Job crafting research, particularly within the South African context, is still largely in its infancy, and there is still much to learn about the construct in terms of the positive benefits that it has for employees and organisations. Also, most recently, a new construct emerged in the literature, which is considered to be somewhat contrary to job crafting behaviour — behavioural self-undermining. To date, there is limited research that looked at the individual-specific factors that predict and result from job crafting and self-undermining behaviours respectively. Accordingly, the overarching aim of the research was to explore the individual antecedents and outcomes of job crafting and self-undermining behaviours within the South African work context.

To achieve this superordinate aim, a series of three independent studies were carried out. In the Study 1 (Chapter 2), the psychometric properties of the JCS (Tims et al., 2012), the JCQ (Slemp & Vella-Brodrick, 2013), and Self-Undermining Scale (Bakker & Wang, in press) were investigated through the application of the Rasch measurement model (Rasch, 1960). In Study 2 (Chapter 3), structural equation modelling (SEM) was performed to explore the indirect effect of individual personality on job performance through job-crafting and self-undermining behavioural processes. Article 3 (Chapter 4) reported the results of a weekly diary study in which the satisfaction of individuals' basic psychological needs was investigated as a mediator of the relationship between weekly job crafting and weekly P-J fit. An overview of the rationale and objectives for each study is provided below.

5.1.2 Study 1 Objective: Investigating the Psychometric Properties of the Scales used to Measure Job Crafting and Self-undermining Behaviour

Research concerning job crafting and self-undermining has predominantly been conducted in European (e.g., Netherlands) and Western countries (e.g., USA) (see Bakker & Wang, in press; Morrow & Conger, 2018). As such, prior to exploring the antecedents and outcomes of job-crafting and self-undermining behaviour, it was considered mandatory to first determine the construct validity of job crafting and self-undermining within the South African working context, which is known for its rich ethnic and multi-cultural diversity. That is, it was important to first understand whether South African individuals interpreted and understood job crafting and self-undermining in the same way as non-South African individuals.

The aim of Study 1 was therefore to investigate the psychometric properties of the JCS, JCQ, and the Self-Undermining Scale using principles derived from item response theory, namely Rasch modelling. Rasch modelling was chosen as the preferred statistical validation technique because it enables one to assess the psychometric properties of existing measures with greater rigour than traditional classical test theory approaches (i.e. EFA and CFA), and allows for more accurate statistical conclusions (Boone, Staver, & Yale, 2014). For example, Rasch analysis allows one to determine the hierarchical ordering of items in terms of their difficulty, and also allows one to test how well the response categories function in capturing the underlying construct of interest. No studies to date have inspected the psychometric properties of the above measures using the Rasch measurement model, thus making this study unique. The aim of the Study 1 was achieved through the following objectives: To assess the dimensionality of each scale and the fit of their items to the Rasch measurement model; to explore the functioning of the category response formats for each scale; to inspect the person reliability and separation for each scale; and to determine whether DIF was present for any of the scale items across two sub-groups, namely age and gender.

5.1.3 Study 2 Objective: Exploring the Indirect Effect of Personality on Job Performance through Job Crafting and Self-undermining Behaviour

It has been said that, in all types of jobs, employees have the latitude to define the meaning of their work through job-crafting behaviour (Wrzesniewski & Dutton, 2001), meaning that regardless of how routine or standardised a given job is, employees still have the opportunity to craft their work and make it their own. While this may indeed be true, it is argued that not

all employees are inclined to shape their work, because it simply is not in line with who they are as individuals, that is, their personality type. Job crafting is a proactive behaviour that, in a sense, would require an individual to have a proactive personality. In fact, research has found that a proactive personality is a significant predictor of job-crafting behaviour (Bakker, Tims, & Derks, 2012). In terms of self-undermining, not much is known about the construct, as it was only recently introduced in literature (Bakker & Wang, in press). As with job crafting, it is also argued that individuals with certain personality traits will be more inclined to engage in behavioural self-undermining.

Due to the lack of knowledge surrounding the individual antecedents (i.e. personality) of job-crafting and self-undermining behaviours, the aim of the Study 2 was to explore personality as a precursor to these two behaviours and to determine the subsequent (indirect) effect of personality on an individual's job performance through job crafting and self-undermining behaviour. More specifically, it was hypothesised that an individual's personality according to Big Five personality traits would affect the type of job-crafting behaviour in which he or she engages (i.e. task crafting, relational crafting, and cognitive crafting), which, in turn, would influence his or her job performance (i.e. IRB and OCB). Regarding self-undermining, it was hypothesised that their scores on the Dark Triad of personality would predict individuals' self-undermining behaviour, and, in turn, their job performance (i.e. CWB). To put the hypotheses to the test, SEM was used.

5.1.4 Study 3 Objective: Job Crafting as a Means to Satisfy Basic Psychological Needs and Improve P-J Fit

Wrzesniewski and Dutton (2001) coined the term *job crafting* and proposed three distinct types of job-crafting behaviour, namely task crafting, relational crafting, and cognitive crafting. The authors state that an individual's motivation to engage in any three of these job-crafting behaviours arises from three individual needs: a need for control over the job, a need for a positive self-image, and a need for human connection with others. While proclamations have been made that job crafting can satisfy these three individual needs (Bakker & Van Woerkom, 2017; Slemp & Vella-Brodrick, 2014; Tims, Derks, & Bakker, 2016; Wrzesniewski & Dutton, 2001), there is a dearth of empirical research that provides support for these claims. Furthermore, since the inception of job crafting research (Wrzesniewski & Dutton, 2001), it

was has found that job crafting behaviour fluctuates on a daily and weekly basis, thus indicating the dynamic nature of the construct.

Drawing from self-determination theory and using a weekly diary design, the Study 3 not only tested job crafting as a week-level phenomenon, but also determined that weekly job crafting can indeed satisfy the three individual needs originally proposed by Wrzesniewski and Dutton (2001). In addition, the study explored the indirect effect of weekly job crafting on weekly P-J fit, an often-cited outcome of job crafting that has not received much research attention. The aim of the Study 3 was thus to determine the indirect effect of each job crafting behaviour (i.e. task, relational, and cognitive crafting) on P-J fit through basic needs satisfaction as a mediator. Basic needs satisfaction comprises of three distinct dimensions, namely autonomy need satisfaction, competence need satisfaction, and relatedness need satisfaction. Due to the nested/hierarchical structure of the data (i.e. measurement occasions nested within individuals), multilevel mediation was used as the preferred statistical analytic method.

5.2 DISCUSSION OF THE MAIN FINDINGS OF THE THREE STUDIES

Having stated the objectives of each study, this section provides a synopsis of the main findings of each study. Thereafter, the limitations pertaining to each study are discussed, followed by recommendations for future research.

5.2.1 Study 1 Results: The Psychometric Properties of the JCS, JCQ, and Self-Undermining Scale

Using applications of the Rasch measurement model, Study 1 investigated the psychometric properties of three organisational behaviour measures that were used to measure job crafting and self-undermining behaviour. The most widely used measure of job crafting, the JCS (Tims et al., 2012), consists of 21 items that measure four independent job-crafting dimensions, namely *Increasing structural job resources* (five items), *Increasing social job resources* (five items), *Increasing challenging job demands* (five items), and *Decreasing hindering job demands* (six items). The second scale used was the JCQ (Slemp & Vella-Brodrick, 2013), which consists of 15 items that measure *Task crafting* (five items), *Relational crafting* (five items), and *Cognitive crafting* (five items) behaviours. The rationale for selecting these two job-crafting measures was that they differ in how they measure and construe job-crafting behaviour. The JCS is based on JD-R theory, while the JCQ is built on Wrzesniewski and

Dutton's (2001) original conceptualisation of job-crafting behaviour, and, thus, validating both measures was deemed necessary. The third and final scale was the newly developed Self-Undermining Scale (Bakker & Wang, in press), which consists of six items that provide a composite score for behavioural self-undermining. The instruments were analysed with respect to their dimensionality, category- and item functioning, reliability, and their ability to measure invariantly across individuals (i.e. DIF).

5.2.1.1 The Self-Undermining Scale

As a newly-developed measure, the Self-Undermining Scale performed well under the strict assumptions of the Rasch measurement model, with only a few issues being detected for two of the scale items. Investigation of category fit showed that the five categories (i.e. *1 = Never, 2 = Seldom, 3 = Regularly, 4 = Often, 5 = Very often*) used to capture behavioural self-undermining fit well to the Rasch model. However, worthy of noting is that there was a low frequency count reported for the three upper-most categories, which captured less than 15% of the total responses. While all the categories showed good fit to the Rasch model, it appeared that a five-category response format may not be the best categorisation scheme to measure self-undermining behaviour at work, and that, perhaps, fewer response categories would suffice. In terms of item fit, one item ("I make mistakes") showed misfit; however, the size of the misfit was so trivial that it is not cause for concern. The misfit of the item was attributed to the way in which the item was phrased. In particular, the item did not provide enough context to allow respondents to determine a definite and accurate response. Because the Self-Undermining Scale is used to measure self-undermining at work, it was suggested that the misfitting item be rephrased to 'I make mistakes *at work*' to contextualise the item for the work setting, and, in this way, limit confusion when endorsing this particular item. Furthermore, post-hoc analysis showed that the exclusion of the misfitting item did not make a substantial difference in the way in which the individuals were measured, and, as such, it was suggested that the item could be retained in future administrations, but caution should be exercised.

The Self-Undermining Scale showed good person reliability (i.e. internal consistency), and may thus be considered a reliable measure of self-undermining behaviour within the South African work context. The person separation, however, was slightly lower than desired (< 2), which indicated that the scale did not perform as well in distinguishing between individuals with high versus low levels of self-undermining behaviour. The reason why the person

separation was low was because the majority of the sample endorsed the lowest response categories, and thus the scale could not provide sufficient information (i.e. estimates) about individuals who scored high on self-undermining. This again, reinforces the idea of collapsing the number of categories to provide participants with fewer response options, which, perhaps, would result in more accurate accounts of their self-undermining behaviour. Lastly, results from the DIF analysis revealed that only one item ("I create confusion when I communicate with others at work") showed DIF for gender, with men finding the item slightly more difficult to endorse then women did. Findings from previous research that showed gender differences in communication was provided to give meaning to this finding.

5.2.1.2 The JCS

Results from the Rasch analysis of the JCS showed that the scale performed relatively well under the assumptions of the Rasch measurement model, yet there were some instances of item misfit and DIF for some of the items that are worth noting. Firstly, inspection of the category probability curves and category fit statistics indicated proper category functioning for the JCS. That is, the category measures and Andrich thresholds increased monotonically across the rating scale, as desired. In a similar (but opposite) fashion to the Self-Undermining Scale, a low frequency count was observed for the two lower-most categories (*1 = Never*; *2 = Seldom*), meaning that the participants hardly made use of these response options, suggesting that they engaged quite frequently in job-crafting behaviour. For the dimensions *Increasing structural job resources* and *Decreasing hindering job demands*, inspection of their construct maps showed that a large portion of the participants' measures (i.e. their ability to craft their jobs: between -1 and 2 logits) were not effectively targeted by their respective items, and, per Linacre's (2016) suggestions, it was suggested that more items be included for these two dimensions, to measure the full range of individuals' job-crafting behaviour.

With respect to the fit of the 21 items that comprise the JCS, results showed that only one item ("I decide on my own how I do things") displayed excessive misfit. The misfit of the item was attributed to the vague manner in which the item is worded (i.e. the word "things"), and it was suggested that the item be rephrased to read: "I decide on my own how I do *my work*," to alleviate any possible response confusion. In terms of reliability, all four *Job crafting* dimensions had good internal consistency (i.e. person reliability). However, apart from *Increasing social job resources*, the dimensions had lower-than-desired person separation,

which is the ability of the measure to distinguish between individuals who have high versus low levels of a given trait (Linacre, 2016). The low person separation came as no surprise, however, because the two lower-most response categories were underutilised (as mentioned above), and, thus, could not provide accurate estimates of individuals who scored low on *Job-crafting behaviour*. Lastly, a DIF analysis for the 21 items showed that three items ("I make sure I use my capacities to the fullest"; "I regularly take on extra tasks even though I do not receive extra salary for them"; "I try to make my work more challenging by examining the underlying relationships between aspects of my job") displayed signs of DIF for gender. That is, men and women interpreted these three items differently, and it was thus suggested that these items be set aside in future administrations where the aim is to detect gender differences in job-crafting behaviour. The reader can find a published version of the Rasch analysis for the JCS at https://journals.sagepub.com/doi/abs/10.1177/1069072718788787

5.2.1.3 The JCQ

Inspection of the category probability curves and category fit statistics for the JCQ showed that the category measures and thresholds increased monotonically across the rating scale, suggestive of proper category functioning and good fit to the Rasch measurement model. Similar to the JCS, it was found that the majority of the sample endorsed the highest response categories possible, with only a few responses being captured by the lower response options. Despite this observation, the categories showed good fit and were within the desired fit range. However, it is worthy to note that inspection of the Wright Maps for both *Task crafting* and *Cognitive crafting* showed that there was some unexplained portion of these two constructs that was not accounted for by the items and categories, and it may be that more items are needed to effectively measure the full range of these two constructs. According to Linacre (2016a), when there are gaps of more than .50 logits in the item distributions, there is a need for more items to fill these gaps.

Referring to the fit of the 15 items that comprise the JCQ, two items ("Give preference to work tasks that suit your skills or interests"; "Choose to mentor new employees officially or unofficially") showed misfit to the Rasch model, which was argued to be a result of their double-barrelled nature, and suggestions were made to improve the fit of these items for future administrations. Furthermore, all three *Job crafting* dimensions were considered reliable measures of their underlying construct, as reliability analyses showed good person reliability

(i.e. internal consistency) for each dimension. However, a trend was observed for the three dimensions, namely that their person separation indexes were slightly lower than desired (< 2), which was argued to be a result of the three upper-most categories being the modal categories and, thus, there was not enough information to provide accurate estimates for individuals who scored low on these dimensions, hence their low person separation indexes. Lastly, while there were three items initially flagged for DIF, due to their statistical significance, only one item ("Remind yourself about the significance your work has for the success of the organisation") proved to be practically significant (i.e. large enough to be of concern), and, based on its practical significance, it was suggested that it be set aside in future studies aimed at detecting gender differences in job-crafting behaviour.

5.2.2 Study 2 Results: Personality as an Antecedent to Job Crafting and Self-undermining Behaviour and the Subsequent Effects on Job Performance

The aim of Study 2 was to investigate the indirect relationship between individual personality and job performance through job crafting and self-undermining behaviour. It was hypothesised that 1) the Big Five personality traits would indirectly affect job performance through job-crafting behaviour; and 2) the Dark Triad personality traits would indirectly affect job performance through self-undermining behaviour. The hypotheses, which were largely confirmed, were tested by means of SEM.

In terms of job crafting, results showed that the Big Five personality traits were significant predictors of job-crafting behaviour and, in turn, job performance. In particular, employees who scored high on *Extraversion* and *Agreeableness* engaged in relational forms of job crafting, which, in turn, resulted in increased OCB-I. On the other hand, individuals who were more open to experiences and conscientious engaged in task-crafting behaviour and, in turn, had higher scores on *IRB*. With regard to the final Big Five trait, individuals who scored high on *Neuroticism* engaged less in relational crafting behaviour and reported less accounts of OCB-I. In sum, the findings provided strong support for an indirect relationship between personality and job performance through job-crafting behaviour, and provide sufficient evidence for personality as an antecedent of job crafting.

With regard to self-undermining, results of the SEM analysis showed that, when analysed as separate traits (i.e. Machiavellianism, narcissism, psychopathy), only psychopathy had an

indirect relationship with CWB-I through self-undermining. That is, individuals who scored high on *Psychopathy* engaged in self-undermining behaviour, and, in turn, reported increases in their CWB towards other individuals. This finding suggests that individuals who are impulsive, vengeful, and thrill-seeking (i.e. psychopathic) are more likely to undermine themselves at work (i.e. create conflict and rivalry with co-workers, harm professional relationships, disregard organisational rules), which, in turn, may fuel counterproductive behaviours that are harmful to others (i.e. CWB-I), such as ignoring, insulting, and arguing with others.

On the other hand, when the Dark Triad was modelled as a higher-order factor or total dark core, as previous research demonstrated (e.g., Bertl, Pietschnig, Tran, Stieger, & Voracek, 2017; Jonason, Li, & Teicher, 2010), there was evidence of statistical significance. More specifically, there was an indirect relationship between the Dark Triad (total) and CWB-I through behavioural self-undermining as a mediator, suggesting that individuals who possess a common dark core are more likely to undermine themselves at work and engage more in harmful acts towards other individuals (i.e. CWB-I). Taken together, support was indeed found for an indirect relationship between personality (i.e. DT) and performance through self-undermining behaviour, and for personality as an antecedent of behavioural self-undermining.

5.2.3 Study 3 Results: Job Crafting as a Means to Satisfy Basic Psychological Needs and Improve P-Job Fit

In Study 3, a weekly diary study was performed to investigate the indirect relationship between weekly job crafting and weekly P-J fit through weekly need satisfaction as a mediator. Participants were tracked over a period of four weeks, and, at the end of each work week, participants rated their job-crafting behaviour, their needs satisfaction, and their P-J fit. To investigate the relationships between the variables, the study made use of multilevel modelling. Inspection of the ICCs showed that there was enough between-person (Level 2) variance to pursue MLM.

Results from multilevel mediation indicated that weekly needs satisfaction indeed mediated the relationship between weekly job crafting and weekly P-J fit. Because calls have been made to stop aggregating the basic psychological needs (De Gieter et al., 2017; Van den Broeck, 2016), each basic need was tested separately to determine its unique effects. In particular, weekly

competence satisfaction mediated the relationship between (a) weekly task crafting and weekly P-J fit, and (b) between weekly cognitive crafting and weekly P-J fit, suggesting that, through task and cognitive job crafting behaviour, individuals were able to satisfy their need for competence, and, in turn, experience a better fit to their job in the same week. Furthermore, weekly autonomy satisfaction was found to mediate the relationship between weekly task crafting and weekly P-J fit, suggesting that individuals can increase their feelings of control and fit to the job through weekly task-crafting practices. In sum, the results from the weekly diary study showed that job crafting can indeed be an effective means through which individuals can satisfy their basic psychological needs and improve their fit to the job.

5.3 PRACTICAL IMPLICATIONS AND CONTRIBUTIONS OF THE STUDY

The findings obtained from the three independent research studies have not only contributed to the literature in a number of ways, but have also yielded a number of implications that are worthy to take note of for future practice. A detailed discussion of the unique contributions and practical implications of each study can be found in the conclusory sections of Chapters 2, 3, and 4 respectively. The following section provides a summary of the practical implications and contributions of the entire study.

The study showed that the scales used to measure job crafting and self-undermining behaviour are indeed reliable and valid measures of job crafting and self-undermining within the South African work context, contributing to research concerning the validity of the instruments and answering calls made to test the functioning of these scales in other national and non-European contexts (Bakker & Wang, in press; Tims et al., 2012). To my knowledge, this is the first study to fit the JCS, the JCQ, and the Self-Undermining Scale to the Rasch measurement model, and the first to employ an item response theory approach to validation of the scales. While the Self-Undermining Scale is still under review in the journal *Work and Stress* (see Bakker & Wang, in press), this can be considered the first study to have cross-validated the instrument for degree purposes using a more modern psychometric approach to validation, namely Rasch modelling. Furthermore, the execution of the Rasch analysis provided new and interesting insights into the psychometric properties of the scales that have not yet been disclosed to date, such as the hierarchical ordering of the items (in terms of their difficulty), the functioning of their response formats, and their ability to measure invariantly across age and gender groups, which is a unique contribution. For practice, the findings of the study demonstrate the strength

and utility of Rasch modelling in exploring the psychometric properties of existing measures, as well as measures that are still undergoing development.

The study contributes to the body of knowledge regarding the individual antecedents of job crafting and self-undermining behaviour. It sheds light on the fact that, despite all jobs presenting employees with the opportunity to job craft or even self-undermine, whether they decide to engage in any of these behaviours may actually be a function of who they are as individuals, that is, their unique personality traits. When hiring new employees, it is thus important that organisations to ensure that prospective employees not only have the rights skills, knowledge, and competencies for the job, but also the right personality, because the study demonstrated that the personality of individuals affects the behaviours they engage in at work (e.g., job crafting and self-undermining) and their subsequent job performance. Organisations should thus employ effective workplace mechanisms or strategies, such as personality assessments, to gain a better understanding of the individuals in their employ, and to potentially forecast the behaviours in which they may be more inclined to engage in the future, based on their standing on particular personality traits. For example, organisations may want to consider hiring individuals with high levels of extraversion and agreeableness, as these individuals may take ownership of their jobs through relational crafting behaviour and perform more extra-role or voluntary workplace behaviours (i.e. OCB). Furthermore, organisations and managers alike may want to flag individuals who score high on the Dark Triad of personality, as these individuals, as this study suggests, may be more inclined to engage in deviant workplace acts, such as self-undermining and CWB. Conversely, when teamwork and relationships are critical to successful performance in a given job or project, organisations may want to consider individuals with high levels of social traits like extraversion and agreeableness, as this study showed that these individuals engage in positive workplace behaviours such as relational crafting and helping behaviour (i.e. OCB-I).

Extant research on job crafting has mainly focused on workplace outcomes such as job performance (e.g., Gordon et al., 2015), job satisfaction (e.g., De Beer et al., 2016), work engagement (e.g., Bakker, Rodríguez-Muñoz, & Sanz Vergel, 2015), and meaningfulness (e.g., Tims et al., 2016), with less attention given to the positive effects that job crafting can have on an individual's basic psychological needs and P-J fit. It is important to understand the effects of job crafting on the satisfaction of an individual's basic needs and P-J fit, as research has

shown that these two constructs are linked to both employee well-being and performance (see Deci & Ryan, 2001; Peng & Mao, 2015). With regard to the well-being, this study showed that employees can indeed satisfy their basic psychological need for autonomy, competence, and relatedness through job-crafting behaviour. Since the satisfaction of basic psychological needs is related to the well-being and performance of employees (Baard et al., 2004; De Gieter et al., 2017; Deci et al., 2001; Reis et al., 2000; Ryan & Deci, 2000; Slemp & Vella-Brodrick, 2014), organisations are urged to encourage their employees to engage in more proactive behaviours like job crafting to feel more self-determined (i.e. autonomous), effective (i.e. competent), and connected with other individuals (i.e. related). This study can be considered unique in that it is the first to explore the relationship between job crafting and needs satisfaction using a multilevel (panel) research design, and also contributes to the limited research that has looked at this relationship as a whole. Moreover, given that a weekly diary study was performed, the study contributes to job crafting research by demonstrating the dynamic and week-level change in employees' job crafting behaviour, which only a few diary studies have shown to date.

The present study adds to the small body of research on the effects of job crafting on P-J fit. While job crafting has consistently been proposed to improve the fit that an individual experiences in his or her job, the empirical research supporting these claims is, although promising, still in its infancy. The findings from the present study provide strong empirical support for job crafting as a means to improve P-J fit, which has some practical implications. For example, organisations should encourage their employees to take initiative and ownership of their jobs through job-crafting behaviour, to create a better alignment between themselves and the job, which, in turn, may have a positive ripple effect on their overall productivity and experience at work.

Last, but certainly not least, the study adds to the scant body of knowledge regarding job-crafting within the South African work context. South Africa is a country known for its rich ethnic make-up and cultural diversity, offering a unique context for researchers to extract useful information. While job crafting research has predominantly been carried out in the Asian, European, and Western regions of the world (Chen at al., 2014; Morrow & Conger, 2018), this study shows that, like elsewhere, South African individuals can also employ job-crafting

practices as an effective means to obtain a more meaningful work experience and to improve their overall wellbeing and performance at work.

5.4 LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This section discusses the limitations of the research and offers some useful recommendations for future research. The first limitation concerns the cross-sectional nature of the first two studies. Given that the data for these two particular studies were collected at a single point in time, they only offer a 'snapshot' of the sample's behaviour in question. While the cross-sectional design of these two studies was both time- and cost effective, as a whole, it remains weak in establishing causality (Tucker, 2011). Future researchers may want to consider longitudinal research designs to determine whether there are any alternative causal relationships between the study variables, and to validating the scales while considering within- and between-person variances. The next limitation has to do with the context from which the samples were drawn. Classen (1997) states: "Never can a test score be interpreted without taking note of and understanding the context in which the score was obtained" (p. 306). All the individuals who participated in the research were South African working individuals, and, as such, caution should be taken when generalising the findings internationally. In an attempt to replicate the findings, future researchers may want to consider using more heterogeneous samples to determine whether the same relationships exist in other international cultures.

The third limitation of the research concerns the self-report nature of the behaviours being assessed across the three studies. Individuals were requested to rate themselves on the behaviours of interest, and it is possible that some individuals provided accounts of themselves that were not entirely truthful or accurate. According to Tedeschi and Reiss (1981), it is not uncommon for individuals to practise impression management or to fake levels when completing self-reports on their own behaviour, especially when the behaviours being monitored are perceived as negative by others. While employees are most probably in the best position to rate their job-crafting behaviour, P-J fit, and Big Five personality traits, there is the chance of them providing biased (i.e., subjective) scores on variables such as job performance, self-undermining behaviour, and Dark Triad personality traits. Earlier research, for example, has shown that individuals view their own performance differently from how others view it (Ashford, 1989; Harris & Schaubroeck, 1988). However, Woehr, Sheehan, and Bennett Jr. (2005), in a more recent study, concluded that different rating sources of job performance are,

to some extent, equivalent. Taken together, it is recommended that future researchers employ other rating sources, such as supervisor and peer-ratings, to obtain a more holistic and objective view of the behaviours in question.

The final limitation relates to the reliability of the SD3 (Jones & Paulhus, 2014) and the *Autonomy satisfaction* subscale (Deci et al., 2001) used in the second and third studies respectively, which both produced unsatisfactory reliability scores (i.e. Cronbach's alpha < 0.70) (Nunnally & Bernstein, 1994). The SD3 is a personality measure that has mostly been applied in other international contexts, with few if any administrations in the South African context. In a multicultural country like South Africa, it is paramount that assessment measures be appropriately adapted to ensure valid and reliable test results (Kanjee & Foxcroft, 2009). Based on the low reliability of the SD3, it is recommended that further studies be conducted that explore the psychometric properties of the scale, to determine what may be causing the poor construct validity. In addition, future researchers may want to consider alternative Dark Triad personality measures that have been specifically tailored to the South African population (e.g., the WRISc of Van Zyl and De Bruin (2016)).

The weekly diary study (Chapter 4) found low reliability for the *Autonomy satisfaction* subscale that measured the extent to which individuals' need for autonomy was satisfied on a weekly basis. Apart from finding that the items explained little variance in autonomy need satisfaction, the subscale also consisted of negatively or reverse-scored items, which Taylor (2004) advises against, as negatively keyed items can cause conceptual confusion. As with the SD3, a further exploration of the *Autonomy satisfaction* subscale is needed in the South African context, whereby the psychometric properties of this subscale are thoroughly scrutinized and reported.

5.5 CONCLUSION

The main aim of this research was to investigate the individual antecedents and outcomes of job crafting and self-undermining behaviour, which was achieved through three independent research studies. The results showed that job crafting and self-undermining are valid and reliable constructs that have important implications for South African working individuals. Moreover, not only does the personality of individuals affect the behaviours they engage in at work (i.e. job crafting and self-undermining), these behaviours, in turn, influence the extent to

which important individual outcomes are attained, such as needs satisfaction, job performance, and P-J fit.

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